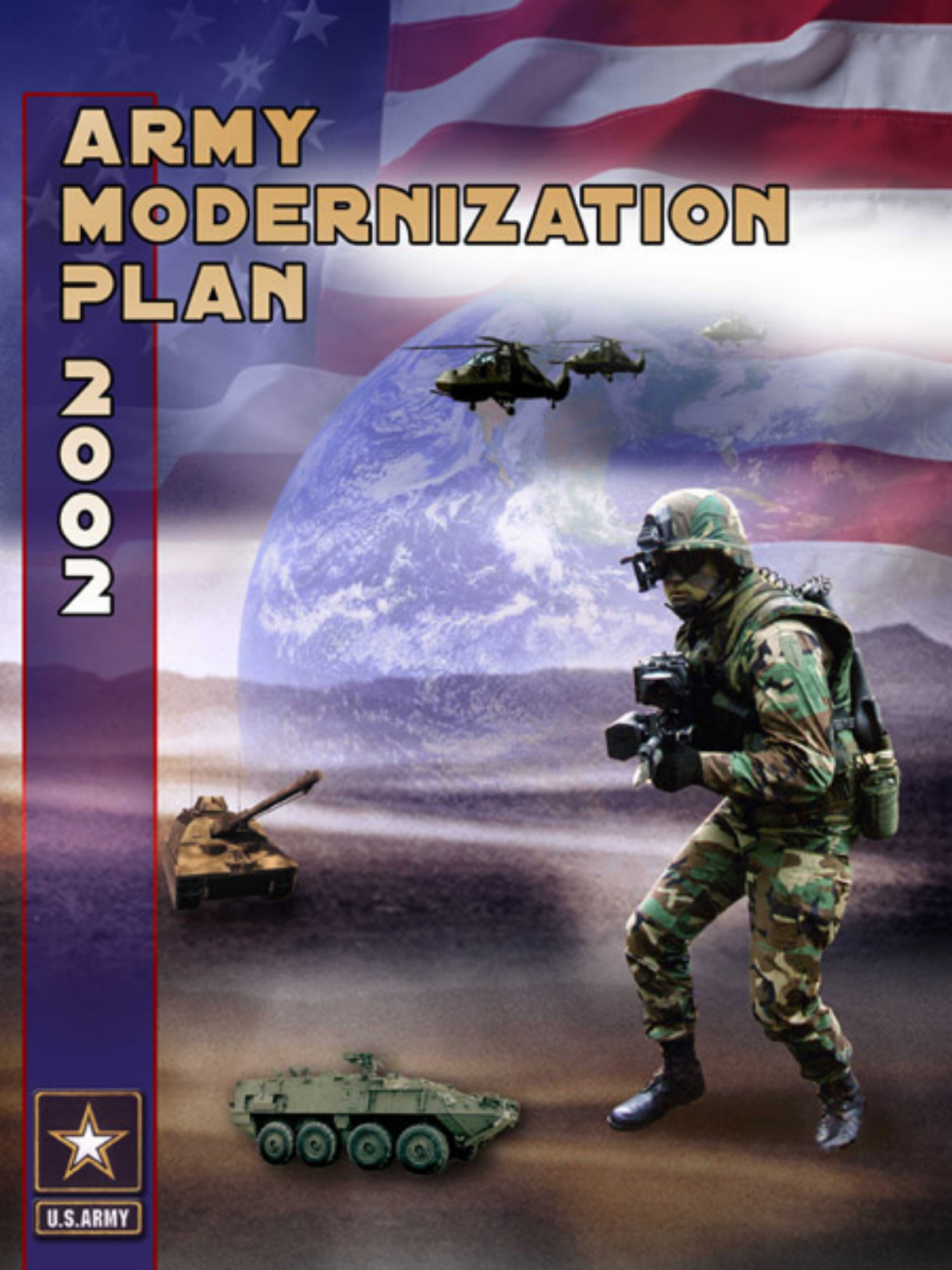
# ARMY MODERNIZATION PLAN

2002



U.S.ARMY

DEPARTMENT OF THE ARMY
OFFICE OF THE DEPUTY CHIEF OF STAFF FOR PROGRAMS
700 ARMY PENTAGON
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SUBJECT: 2002 Army Modernization Plan

In October 1999, the Army unveiled a new Vision, focused on people, readiness and transformation. Since then, the Army has aggressively begun implementing the Vision and has embarked on a comprehensive journey to an Objective Force that will be responsive and dominant across the entire spectrum of military operations. We will do so while always maintaining our non-negotiable contract with the American people to fight and decisively win the Nation's wars. This commitment to the Nation has been visibly reaffirmed since September 2001, with Army forces of all types and components fully committed abroad and at home in the ongoing war against terrorism.

The 2002 Modernization Plan provides an update on the Army's efforts to support and implement Transformation. It describes the Modernization and Investment Strategies adopted by the Army that place priority on pursuing advanced technologies and developing systems to meet future requirements, while at the same time remaining firmly committed to maintaining the readiness of the current force, which will enable Transformation and future readiness for tomorrow's missions.

This Modernization Plan describes how modernization efforts are supporting Army Transformation by building combat capable units using a comprehensive and balanced approach. Ultimately, the success of Transformation depends on our Soldiers and the people who support them, and it involves more than just equipment: For that reason, this year's Plan incorporates new annexes addressing important personnel, training, doctrine, and infrastructure topics, as well as one devoted to Homeland Security.

Congress and the Department of Defense have responded positively to the Army's Transformation plan by providing the resources to create sustainable momentum for the future. The Presidential Budget for fiscal year 2003 reflects continued support for this revolutionary path of change while still preserving the Army's readiness and unwavering commitment to the security of the Nation.

BENJAMIN S. GRIFFIN
Lieutenant General, U.S. Army
The Army G8

# 2002 Army Modernization Plan

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# Executive Summary

## Future Dominance—Current Readiness

In response to the attacks on 11 September 2001, the United States is presently at war using an impressive array of joint military forces and civilian agencies to combat terrorism at home and abroad. Army forces—ranging from Special Operation Forces (Rangers, Special Forces, Special Operations Aviation, Psychological Operations, and Civil Affairs units) to conventional forces (10th Mountain and 101st Airborne Divisions) deployed overseas in Operation Enduring Freedom, and Active Duty, National Guard and Reserve units at home and abroad—are fully participating in this ongoing war against terrorism.

While engaged in these current battles, the Army continues to prepare for future missions. The Army Vision of a more responsive force capable of full spectrum dominance to meet threats whenever and wherever they arise is now more relevant and urgent than ever. The foundation of that Vision remains as before—People, Readiness, and Transformation. The Army's portion of the FY 2003 President's Budget directly supports significant improvements in People and Readiness and acceleration of Transformation.

The *Modernization Plan* describes the Army's Modernization and Investment Strategies, which are being used to fulfill the Army Vision, meet the strategic challenges of today and prepare for the demands of the future. Its purpose is to effectively and efficiently support Army Transformation in order to deliver future readiness at every point on the spectrum of operations. *Balanced Modernization* continues as the overall strategy for weighing current imperatives while transforming to an even better and more relevant force. Only selected modernization and recapitalization investments are being made in the current force in order to free up valuable resources needed to support the Army's Transformation process. While today's Army remains the best in the world and is ready to accept all missions required by the Nation, it is critical to invest wisely in the forces needed for tomorrow's missions.

## Modernization and Investment in Support of Transformation

Building and fielding combat-capable units that provide the President, the Secretary of Defense, and regional Commanders-in-Chief (CINCs) a full array of ground options—the Army's core competencies—is the ultimate goal of Army modernization efforts, for both near and far term. To accomplish this task, the Army employs two key processes, Unit Set Fielding and Software Blocking, both of which work together to produce combat-capable units in the shortest period of time. The overall Modernization Strategy is comprised of the following three fundamental tenets and priorities:

- **Objective Force:** Accelerating fielding of the Objective Force and, in particular, the Future Combat Systems (FCS), the foundation of that force. Over 95% of total science and technology (S&T) funding of $7.9 billion for FY03-07 is specifically targeted for the future Objective Force, an increase of $167 million over FY02. Additionally, the Army has accelerated the FCS acquisition strategy and intends to use a Lead System Integrator to improve system development.
- **Interim Force:** Acting to meet immediate operational requirements to rapidly deploy a highly lethal force capable of full spectrum operations through rapid fielding of an Interim Force composed of six Brigade Combat Teams using a family of new Interim Armored Vehicles (IAVs) and enhanced information technologies to improve situational awareness.
- **Legacy Force:** Maintaining and improving capabilities of the current Legacy Force through selected modernization and recapitalization efforts, thus ensuring continued superiority of the force and enabling future Transformation.

To implement this Modernization Strategy, the Army has made major changes in its investment plans and resourcing in support of ongoing and future Transformation. The Army has made difficult decisions during the budget planning process in order to meet the urgent requirements of the current security environment while at the same time assuming appropriate risk to sustain the momentum of Army Transformation. Balancing risk with the exigencies of readiness, new operational requirements, homeland security, and Army Transformation will remain an overriding imperative for the future.

## Way Ahead

The Army continues on its revolutionary path toward a dramatically improved and transformed force. Initial efforts have involved considerable risk and careful balancing between present and future requirements. Additional resources and support from Congress and the Office of the Secretary of Defense (OSD) have also allowed the Army to accelerate the pace of Transformation and establish sustainable momentum for the future. The FY 2003 President's Budget acknowledges the past accomplishments of the Army in initiating Transformation and provides invaluable support to its continuance. Continued support is, however, essential to achieving Transformation while still ensuring unwavering and full support to the Nation's war on terrorism and opposition to those who would endanger our survival.

# 2002 Army Modernization Plan

## Overview

Today's Army is fully prepared to serve the Nation and stands ready to fulfill all missions required in the current security environment. The changing nature of that security environment, however, and the potential for dramatic advances through new technologies present the need and opportunity to transform the Army into an even more responsive and effective force for the future. Responding to this opportunity, the Army leadership has embarked on a dramatic process of change—Transformation—to make a great Army even better and more relevant.

The Army continues to make significant progress in transforming itself into an Objective Force, which is strategically responsive and dominant at every point on the spectrum of conflict. Attaining an Objective Force capability requires the Army to make significant investments in science and technology and then make the critical decisions on which technologies to resource, thereby ensuring that our Soldiers will have the best equipment in the world. Successful transformation, however, is more than equipment—it is the integration of equipment, doctrine, training, infrastructure, and the development of Soldiers and their leaders into combat-capable units, which will decisively win the wars of the 21st Century.

At the same time the Army invests in the Objective Force of the future, it continues to give the highest priority to the immediate military needs of the Nation. Maintaining current warfighting readiness requires the Army to invest in today's force–the Legacy Force—by recapitalizing key systems and selectively modernizing as required to maintain combat superiority or overmatch on the battlefield until the Objective Force is fully realized. The Army's Interim Force, designed to fill a capabilities gap that exists in today's Legacy Force, will allow the Army to rapidly deploy anywhere in the world with a lethal, survivable and sustainable combat capability. The concurrent requirements of the Objective, Legacy and Interim Forces present a significant resource challenge to the Army. It is a challenge the Army will meet as it fulfills its nonnegotiable contract with the American people to fight and win our Nation's wars.

The Army is successfully implementing the Transformation process begun in October 1999 and has established sustainable momentum on the path to a more strategically responsive and dominant land force. Since the publication of the *2001 Army Modernization Plan*, the Army has:

- Continued its aggressive pursuit of new technologies by engaging in active partnership with industry and government agencies, as well as by establishing a new high-level task force to integrate Army plans for the Objective Force.

- Committed to modernizing the Soldier as a System as the Army transforms to the Objective Force.
- Resourced a recapitalization program of 17 critical systems designed to improve the warfighting readiness of its Legacy Force.
- Initiated the Unit Set Fielding process, integrating a "system of systems" approach to materiel fielding that provides a total operational capability to units, not just new pieces of equipment.
- Started the fielding of the first two Interim Force brigades at Fort Lewis, Washington. Beginning with the second of the two brigades, the Army will use the Unit Set Fielding concept to transform, field and train on new equipment.
- Continued the aggressive training pace of the first Interim Brigade at Fort Lewis by using loaner and surrogate vehicles and successfully developed the Interim Force tactics, techniques and procedures to be used by the remaining Interim Force brigades.
- Identified the previously planned four additional Interim Force brigades and is examining the possibility of placing several of those brigades under the command and control of an Interim Force Division.
- Capitalized on the Interim Brigade Combat Team (IBCT) organization, training, and lessons learned by developing an Interim Cavalry Regiment concept, which is designed to enhance the warfighting capabilities of the Army's 2nd Armored Cavalry Regiment (Light).
- Developed the doctrinal foundation for the Objective Force with the publication of two key documents: Field Manual 3-0 *Operations*, which is the Army's keystone doctrine for full spectrum operations, and the United States Army White Paper: *Concepts for the Objective Force*, which provides government, industry and academia with a broad overview of the advanced capabilities and core technologies needed to enable the Objective Force.
- Made difficult and challenging decisions by prioritizing and reallocating scarce resources, and canceling and modifying programs. This includes reducing the number of systems being recapitalized from 21 to 17 and canceling a total of 18 programs for systems required by the Army. These actions correspondingly increase risks in readiness, but are considered acceptable to allow increased emphasis on Transformation.
- Additionally, the Army is pursuing reforms to improve business practices and operational efficiencies as a vehicle for achieving further savings.

While continuing to transform itself into an even more capable force, the Army—Active, Guard, Reserve, and civilians—remains firmly grounded in its enduring commitment to be ready at all times to fulfill the immediate security requirements of the United States. The Army is already at the forefront of the global war on terrorism, from domestic civil and military support as part of homeland security to overseas deployments and missions of special operations and conventional forces. At the same time, the Army is

fulfilling its critical role of forward presence and engagement with allies and partners overseas, while remaining ready to respond to any contingencies in support of the National Military Strategy.

Bipartisan support from Congress and the continued endorsement of the Department of Defense (DoD) has given the Army the impetus and a down payment on resources needed to get Transformation underway and firmly embedded in Army plans and programs, while still preserving the capability to perform today's missions.

To achieve the goals of Transformation—greater responsiveness and dominating capabilities—the Army pursues a Modernization Strategy that focuses on producing and fielding revolutionary new capabilities for the future force, fulfilling immediate operational capability shortfalls with new systems and organizations in the near term, and maintaining and improving those essential capabilities needed to fulfill all missions in the foreseeable future. To implement this strategy, the Army must make difficult choices and establish clear priorities among competing needs—the goal of the Army's Investment Strategy. This strategy is characterized by a shift in emphasis to the development of new systems and technologies to support the future Army, or Objective Force. At the same time, however, the strategy attempts to balance modernization efforts and strategic risks by maintaining essential readiness and capabilities for the Army of today, particularly for the urgent fight against terrorism that is ongoing at home and abroad. The final balance in this Investment Strategy is reflected in the Army component of the FY 2003 President's Budget (PB03), which reflects the clear priorities and choices the Army has identified and made to implement Transformation.

Significant progress has been made in the past two years in implementing Transformation, though shortfalls do exist. Transformation is a continual and long-term process, and the Army needs sustained support and additional resources to maintain the momentum already established for moving towards a transformed force while simultaneously preserving today's readiness and successfully prosecuting the war on global terrorism.

## Purpose

The *2002 Army Modernization Plan's* purpose is to effectively and efficiently support Army Transformation in order to deliver future readiness characterized by a force that is responsive, deployable, agile, versatile, lethal, survivable, and sustainable at every point on the spectrum of operations. The *2002 Army Modernization Plan, like the* 2001 plan, focuses on building combat-capable units to support the Transformation of the Army and ensuring that the Army continues to maintain sufficient capabilities in all areas necessary to win our Nation's wars decisively and protect our vital national interests in whatever ways needed. Along with the *Army Science and Technology Master Plan*, it provides the rationale and justification for the research, development, and acquisition (RDA) portion of the Army's program in support of PB03. Furthermore, it is fully consistent with and supportive of implementing the guidance of the Army

leadership, which is reflected separately in *The Army Plan* as well as in the annual *Army Posture Statement.* Specifically, the *Modernization Plan*:

- Describes Army Transformation, its progress to date, and how the Army Modernization Strategy supports Transformation.
- Describes the future operational environment and the future warfighting concepts the Army is expected to use in that environment.
- Explains how Army Transformation and its implementation are supported by modernization efforts across the entire breadth of Doctrine, Training and Leader Development, Organization, Materiel, and Soldier Support (DTLOMS).
- Focuses modernization through the application of:
  - Unit Set Fielding
  - Software Blocking
- Describes the Army's Modernization and Investment Strategies.
- Provides information on selected programs that are critical to Transformation efforts.
- Communicates Fiscal Year 2003 (FY03) budget priorities, key accomplishments and remaining shortfalls, and shapes conditions for Army budget planning for future years.

The *Modernization Plan* does not offer the following:

- Specific details on all RDA programs, to include system programmatics (dollars, quantities). This information is provided in other documents to include the *U.S. Army 2002 Weapon Systems Handbook*.
- Specific commitment for budget figures beyond FY03. Any information reflected for these years represents an Army planning estimate and is subject to change.
- Modernization schedules for specific units that are published and disseminated separately.

## Strategic Environment and New Direction

The Army's decision to transform itself is a direct result of an appreciation of the changing strategic environment. That changing environment coupled with the potential of dramatically evolving and even revolutionary new technologies presented the imperative and opportunity for significant change for the Army at this point in history. In the *2001 Army Modernization Plan*, considerable attention was devoted to a discussion of the emerging geo-strategic environment of persistent instability characterized by ethnic rivalries, nationalism, and increasing transnational threats such as terrorist networks. In fact, the observation was made that the most dangerous challenge to U.S. interests would likely be from "combinations of state, non-state, and transnational actors with global reach." Unfortunately, this analysis proved to be all too true in September 2001, and the future strategic environment quickly became an immediate reality. *(Figure 1)*


**Figure 1. Strategic Environment**

## Quadrennial Defense Review and New Defense Strategy

The Quadrennial Defense Review (QDR), which was mandated by Congress, tasks the DoD with defining a defense strategy very early in a newly inaugurated President's administration. This review includes force structure and programs required to implement that strategy at low-to-moderate risk over the ensuing 20 years. The 2001 QDR laid the foundation for a defense strategy that better aligns requirements with available capabilities. It provided strong support for Army Transformation, excess infrastructure reduction, and Soldier quality of life improvements. It did not, however, provide any programmatic or budget decisions. The 2001 QDR was largely completed before the 11 September terrorist attacks on the United States, though those events served to punctuate strongly its results and relevance for the future. The final product released on 30 September represented a clear path for future defense policies.

As part of the assessment of the global security environment, the QDR stressed the need for the Services to transform themselves so they could meet the challenges of the future operational environment and improve or maintain U.S. military preeminence. The overarching goal is to transform while still maintaining near-term readiness, the well being of our people, and the quality of our installations. Within this overall construct, six critical operational goals intended to focus DoD's transformation efforts more specifically are identified in the report:

- Protecting critical bases of operations (U.S. homeland, forces abroad, allies and friends) and defeating chemical, biological, radiological, nuclear, and enhanced high explosive (CBRNE) weapons and their means of delivery;

- Assuring information systems in the face of an attack and conducting effective information operations;
- Projecting and sustaining U.S. forces in distant anti-access or area-denial environments and defeating anti-access and area-denial threats;
- Denying enemies sanctuary by providing persistent surveillance, tracking, and rapid engagement with high-volume precision strike, through a combination of complimentary air and ground capabilities, against critical mobile and fixed targets at various ranges and in all weather and terrains;
- Enhancing the capabilities and survivability of space systems and supporting infrastructure; and
- Leveraging information technology and innovative concepts to develop an interoperable, joint command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) architecture and capability that includes a tailorable joint operational picture

The Army's comprehensive plan to transform itself has already set in motion support for the goals stated above by ensuring the Army, through its core competencies, has the capability to decisively defeat the enemy on the future battlefield with forces that are strategically responsive, deployable, agile, versatile, lethal, survivable and sustainable. In consonance with these goals, the Army must also maintain the ability to conduct tactical assault at the ultimate decision point in any conflict. Employing air and ground sensors, and capitalizing on internetted C4ISR at all tactical and operational echelons of employment, the Army's Objective Force will "see first, understand first, act first and finish decisively." Strategically responsive, highly deployable and with a reduced logistics footprint, the Objective Force will be able to effectively operate in anti-access and area denial environments. It will maintain the Army's current forced-entry capabilities.

As development of Objective Force systems and programs continue, the Army fully expects to provide considerable support for the DoD Operational Goals articulated in the 2001 QDR.

## Homeland Security

Possibly the most significant new outcome of the QDR is the identification of homeland security as the highest priority for the U.S. military. Increased fears of potential asymmetric threats and an increased pace and scale of ballistic missile proliferation raised concerns about the domestic vulnerability of the United States. The attacks of 11 September 2001 converted potential threats to clear and present danger. Translating this new priority into institutionalized roles and resources for both civilian and DoD government agencies requires considerable work. The Army is a key participant in the complementary missions of preventing, protecting and responding to threats to the territorial United States. Signifying the importance of the Army's role in this mission, the Secretary of Defense named the Secretary of the Army as DoD's interim executive agent for homeland security *(Figure 2)*. The Army, as part of the DoD team, is adjusting its structure


**Figure 2. Homeland Security**

and programs to fulfill these new responsibilities. Army Transformation is fully capable of incorporating any necessary adjustments to meet this new mission, and this *Modernization Plan* incorporates a new annex on Homeland Security to discuss the progress to date.

## The Army's Role in the National Military Strategy and Joint and Combined Operations

The Army remains the primary provider of land forces to the Joint Force Commander (JFC) for all of the possible missions identified in the QDR. The Army expects that the majority of missions will be joint in nature. Moreover, in those missions requiring overseas deployments, the Army relies on its sister Services for the critical strategic lift, both air and sea, to get to the theater in a timely manner. Close cooperation among the Services to produce joint interoperability and deployability, coupled with a dynamic program of training and experimentation in peacetime, will be indispensable for the success of the Army's Transformation as well as the respective modernization plans of the other Services. Where possible, cooperative programs with other individual Services and in a joint framework will be highly beneficial and fully supported.

In addition to the imperative for successful joint cooperation, the Army also recognizes that most, if not all, future missions will be characterized by multinational cooperation. Coalitions have been a defining nature of most major military operations in the recent past, from the Gulf War to the Balkan missions, and the likelihood is for this trend to continue and even increase in the future. As a result, the Army views effective international cooperation as an important element in making Transformation successful in both its process and eventual application on future battlefields. Such cooperation will focus on two key and complementary

components—multinational force compatibility or interoperability, and security cooperation.

## Future Operational Environment

The future global security environment outlined in the QDR as the basis for defining the U.S. defense requirements and associated strategy is very similar to the operational environment discussed in the *2001 Army Modernization Plan.* As stated in that document, the most dangerous challenges come from a combination of state, non-state, and transnational actors possessing a global reach *(Figure 3)*. The attacks on the United States in September 2001 demonstrated that this challenge is now a reality, not just a potential threat for the future environment. Additionally, the possible use of military power by nations remains an integral factor in the international environment, and, therefore, any regional crisis retains the potential for escalation into a conflict having implications for U.S. security interests. Moreover, this future security environment presents a situation where military operations will be less predictable in nature and more dynamic in development.

Over the next two decades, U.S. Armed Forces will operate in a geo-strategic environment of considerable instability. Regional powers will grow, new ones will emerge, and transnational actors will arrive on the global scene. Shifting demographics (high population growth causing increased migrations and more pressure on scarce resources), economics (increasing globalization and the spread of transnational business), and technology (widely available advanced systems that are very user-friendly) will drive developed and developing states alike into global networks, altering power relationships within regions.


**Figure 3. Operational Environment**

Globalization demands international interaction on a wide range of issues, creating friction as cultures, religions, governments, and economies network and collide in a highly competitive global setting. It can also be said with reasonable certainty that during this period, state and/or non-state actors will employ or threaten violent force as a means to pursue their interests. That violence will not be limited to where U.S. forces may deploy, but as 11 September has demonstrated, may also occur in the United States.

The operational environment, characterized by eleven critical variables *(Figure 4)* and the emerging threats (shaped in part by the operational environment) that will define the strategic and operational setting for military operations in the next 20 years, will have inherent campaign qualities. For example, if an adversary believes much is at stake, mobilizing all dimensions of his national power is likely. Every person becomes a combatant and every asset a weapon–in short, total war, a concept that cannot be completely dismissed.

This campaign quality extends to the adversary's ability to create, mobilize, develop, and evolve his fighting forces: active, reserve, paramilitary, police and also allows him to adapt. Future campaigns against the United States will

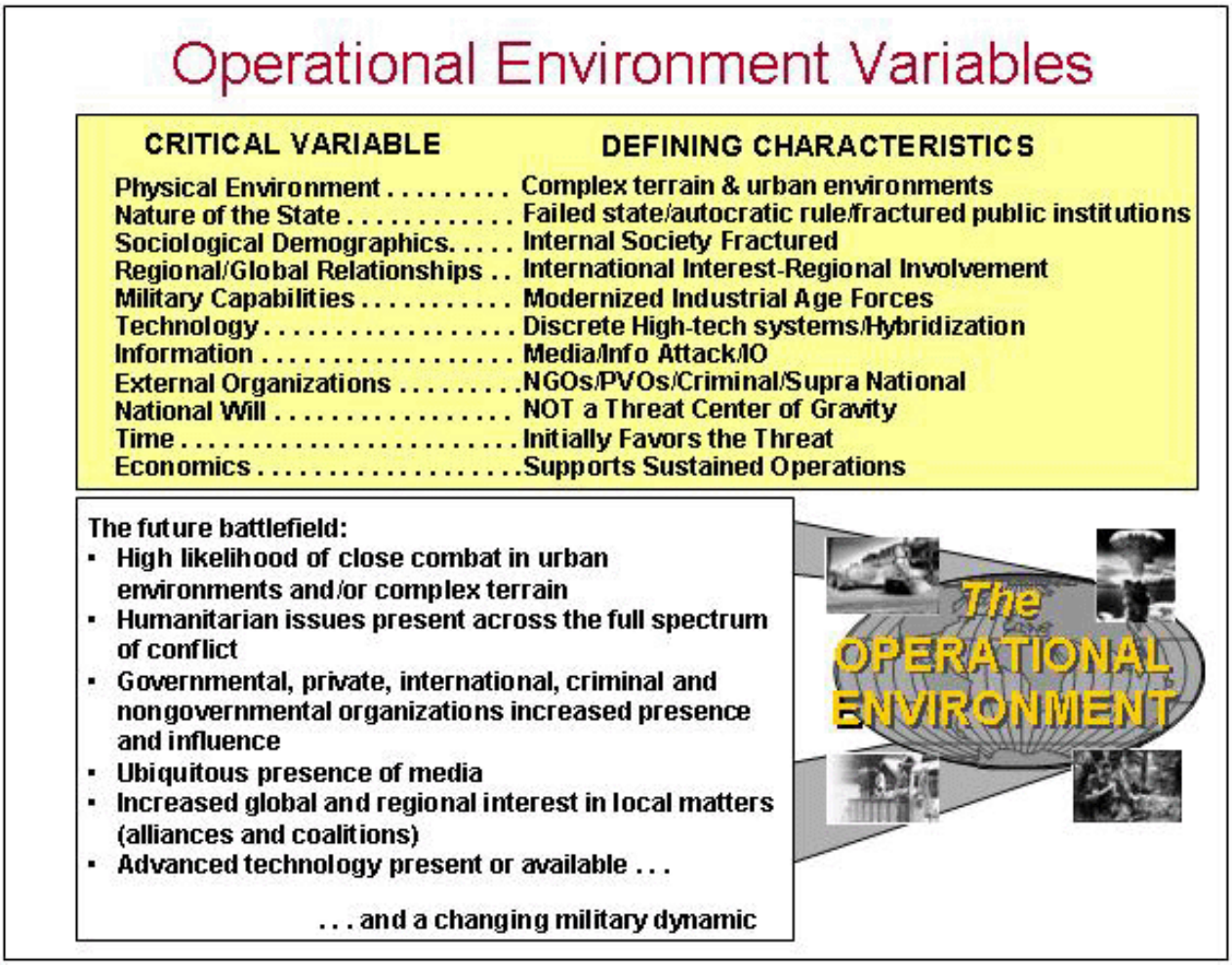


**Figure 4. Operational Environment Variables**

include a balance of asymmetric, adaptive and conventional operations executed over a time frame that allows the results of the campaign to highlight U.S. strategic vulnerabilities, such as the requirement to rapidly deploy forces to conflict areas.

The United States, at present, is able to eventually dominate any military force it will encounter in the various regions of the world. However, the United States must also be able to deploy to those regions where it will meet those forces. Some adversaries conclude that they can conduct operations below a threshold that would elicit a U.S. military response; others realize that they must attempt to keep the United States from deploying to their regions. To accomplish this goal, several adversaries will use all means possible, military, political, economic and even terrorist attacks on the U.S. or allies' homelands to pressure the United States and its allies from ever deploying forces to intervene in conflict regions. If they are unable to preclude U.S. or allied intervention, they will try to exclude our forces from entry by denying or striking the airbases or seaports our forces will need to conduct operations and sustain their operations. They are likely to employ cruise and ballistic missiles, aircraft and unmanned aerial vehicles (UAVs), special purpose forces and terrorists. If U.S. or allied forces are able to deploy, these adversaries will attempt to delay or stop the flow of U.S. assets and support into an area. If the United States is successful in deploying forces to an area, the enemy will use all of the operational environment factors to influence the conduct of operations. Additionally they will employ any niche technological enhancement in weapons technology they have been able to integrate into their forces to increase their own capability. Finally, adaptive, learning forces will operate from dispersed and decentralized positions, use extensive cover, concealment, camouflage, denial and deception to complicate U.S. advantages in targeting and long range standoff weapons delivery. The goal of these operations is to create opportunities for their forces to prolong the conflict, cause U.S. casualties and create conditions to end the conflict under conditions favorable to themselves.

In response to the expected security environment, the Army must remain effective across the full spectrum of conflict. This includes responses against both modernized conventional forces, possibly employed in an unconventional manner, as well as unconventional forces employing asymmetric strategies, capabilities, and tactics *(Figure 5*). Army Special Operations Forces (ARSOF) currently operate in this environment by conducting unconventional operations across the full spectrum of operations. As recent events have shown, it is likely that adversaries will seek new means of dealing with U.S. forces, while the Army continues to adapt doctrine, organizations and systems to be prepared to fight adaptive adversaries.

To meet the challenges of the future operational environment, the Army must protect the U.S. homeland while simultaneously providing a strategically responsive force effective across the full spectrum of conflict. Current Army forces, while the best in the world, have deficiencies that must be addressed to form the type of forces required for the new environment. Army forces must


**Figure 5. Special Operations Forces**

retain a quality of adaptive dominance–the ability to dominate any situation regardless of how an adversary reacts. This adaptive quality will require future forces with inherent versatility and adaptive Soldiers, civilians, and leaders who can account for the critical variables inherent in the future operational environment.

This requirement is the underlying imperative for the Army Vision announced in 1999 and the subsequent Transformation process presently underway. This need for change, coupled with the technological potential for revolutionary advancements, makes substantial change through Army Transformation both essential and an achievable objective.

# Army Transformation

## Overview and Timeline

The Army Vision is "Soldiers on point for the Nation…Persuasive in Peace, Invincible in War." This Vision is built on the foundation of the hard work and experiences of previous generations of Army Soldiers, civilians, and leaders, but it also ensures that the Army of today and tomorrow will be prepared to meet successfully the requirements of the new strategic and operational environment of the 21st Century. Building on the historical lessons learned in the past—especially more recent experiences in Panama, the Gulf, Somalia, Bosnia, and Kosovo—the Army plans to incorporate and take advantage of advanced technologies to adapt itself to future challenges. Three integral components are interwoven in the

Army Vision—Readiness, People, and Transformation—and are indispensable to its eventual success.

**Readiness** remains the Army's top priority and will be its enduring focus in fulfilling what is termed the "nonnegotiable contract with the American people to fight and win the Nation's wars—decisively." Today's Army has to be prepared to perform a wide range of worldwide missions, ranging from defense of the United States to peaceful engagement and combat operations abroad as required to defend our interests and those of our allies and friends.

**People,** however, remain the Army's centerpiece and are its investment in and link to the Nation it serves. Soldiers—Active, Guard, and Reserve—backed by the support from the extended community of civilians, family members, retirees, veterans, and contractors represent the ultimate means of fulfilling the Army's duty to the Nation. Their well-being is vital to the Army's overall capabilities and its ability to conduct all missions assigned. In the final analysis, the realization of the Army's Vision and its associated Transformation will depend directly on our Soldiers and the people who support them.

**Transformation** represents the necessary change in the Army's nature and composition as well as in the way the Army will fight, and it is a process of change that is well underway. Ultimately this process will produce a future force, the Objective Force, that will be capable of victory in a major theater of war, responsive and flexible for rapid mission tailoring required of crisis response, versatile for success in stability and support operations, and durable enough for extended regional engagement. It will be interoperable as a member of a joint and possibly multinational team. This force is further defined by its ability to deploy a combat brigade in 96 hours, a division in 120 hours, and five divisions in

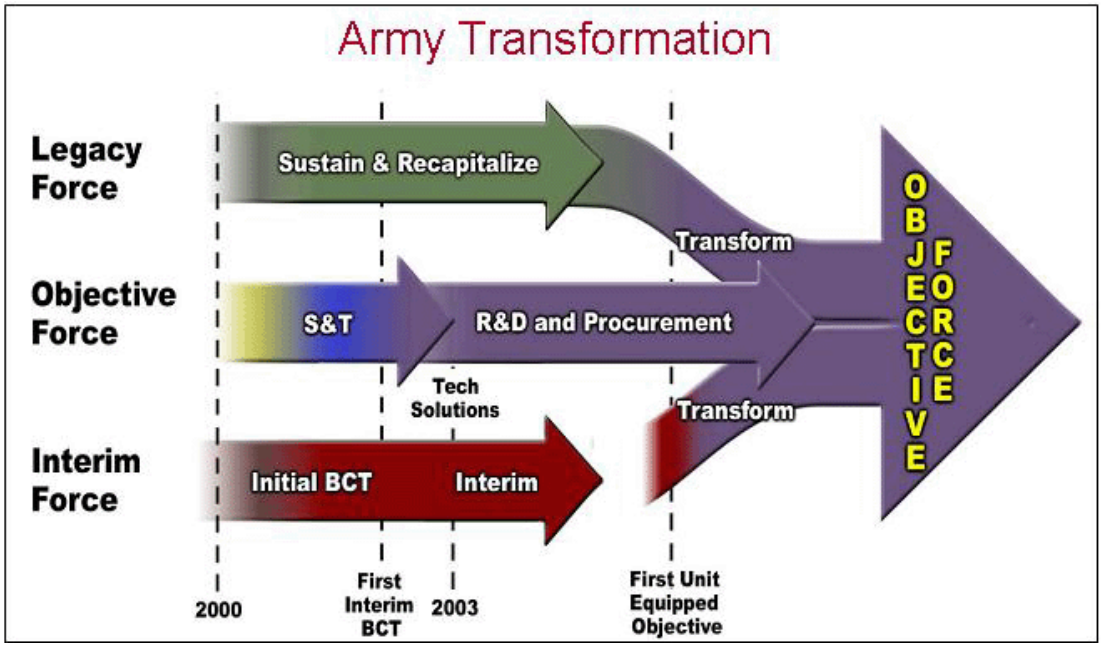


**Figure 6. Transformation**

theater in 30 days. The Army's challenge in the years ahead is to maintain the trained and ready force needed by the Nation, while at the same time transforming both the operational and institutional Army.

Army Transformation efforts are synchronized by the Transformation Campaign Plan (TCP), the mechanism for integrating and synchronizing the elements of the Army Vision. *Figure 6* depicts the readiness of the Legacy Force, the science and technology effort to achieve the Objective Force, and the fielding of the Interim Force. Transformation efforts integrate advancements in doctrine, leader development, organizations, materiel, and Soldier systems while also incorporating changes in deployment, installations, sustainment, and business practices.

Transformation to the Objective Force is a continuous process based on the goal of achieving the initial Objective Force capability this decade, contingent upon technology advancements, funding levels, and unit availability. The timeline in *Figure 7* depicts the planned conversion of units within the current Army to Interim and Objective Forces. The Army will begin fielding the first Objective Force unit in 2008. In 2010 the Army plans to attain an Initial Operational Capability (IOC) for the first Objective Force Brigade, or equivalent unit, and will begin the fielding of three Objective Force Brigades annually. By 2016 the Objective Force will consist of five divisions and will assume the first-to-fight mission. The Legacy Force, however, will still be needed to supplement the capabilities of the Objective Force until 2032, by which time the entire force is expected to have completed Transformation.

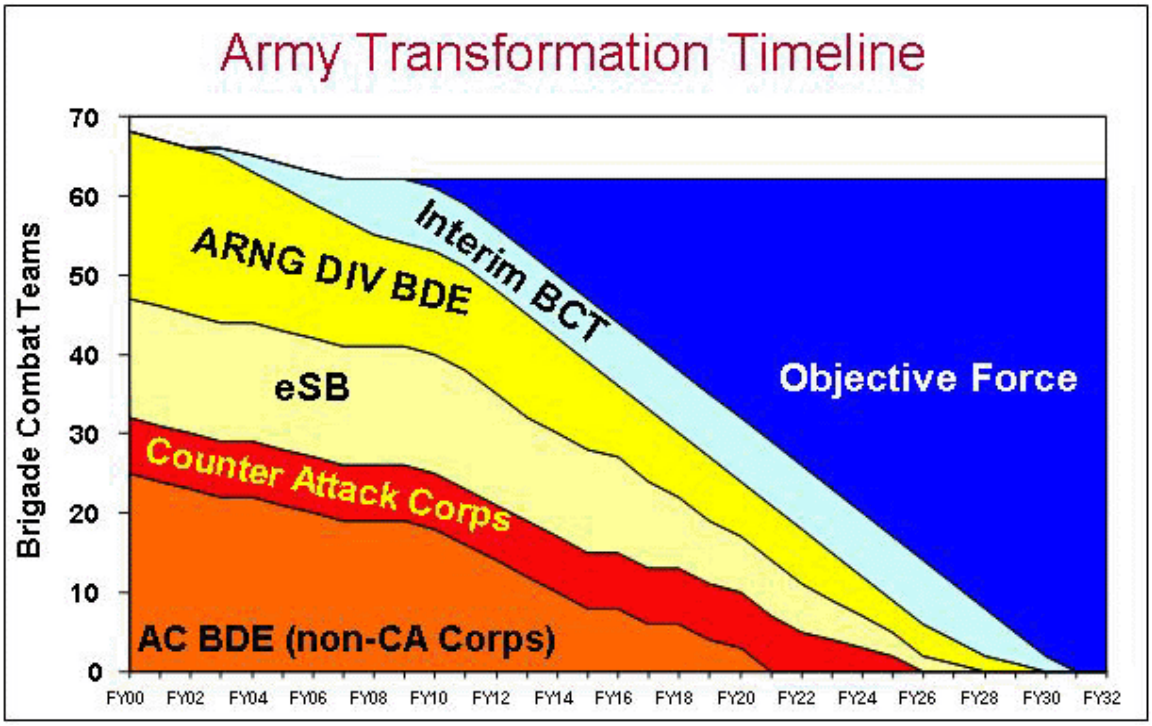


**Figure 7. Transformation Timeline**

## Objective Force

The Objective Force is our future full spectrum force: organized, manned, equipped, and trained to be more strategically responsive, deployable, agile, versatile, lethal, survivable and sustainable across the entire spectrum of military operations from major theater wars (MTWs) through counterterrorism to homeland security. Objective Force units will conduct operational maneuver from strategic distances, and arrive at multiple points of entry, both improved and unimproved. As necessary, Objective Force units will conduct forcible entry, overwhelm aggressor anti-access capabilities, and rapidly impose our will on our opponents. In this manner, Objective Force units arrive immediately capable of conducting simultaneous, distributed and continuous combined arms, air-ground operations, day and night in open, close, complex, and all other terrain conditions throughout the battlespace. Army units conducting joint and combined operations will *see first, understand first, act first and finish decisively* at the strategic, operational, and tactical levels of war. (*Figure 8)*

Army Objective Force units will dominate land operations, providing the decisive complement to air, sea and space operations. They will create synergy within the Joint Task Forces by controlling the ground, where people and political authorities reside, and by defeating our opponents in their protective sanctuaries

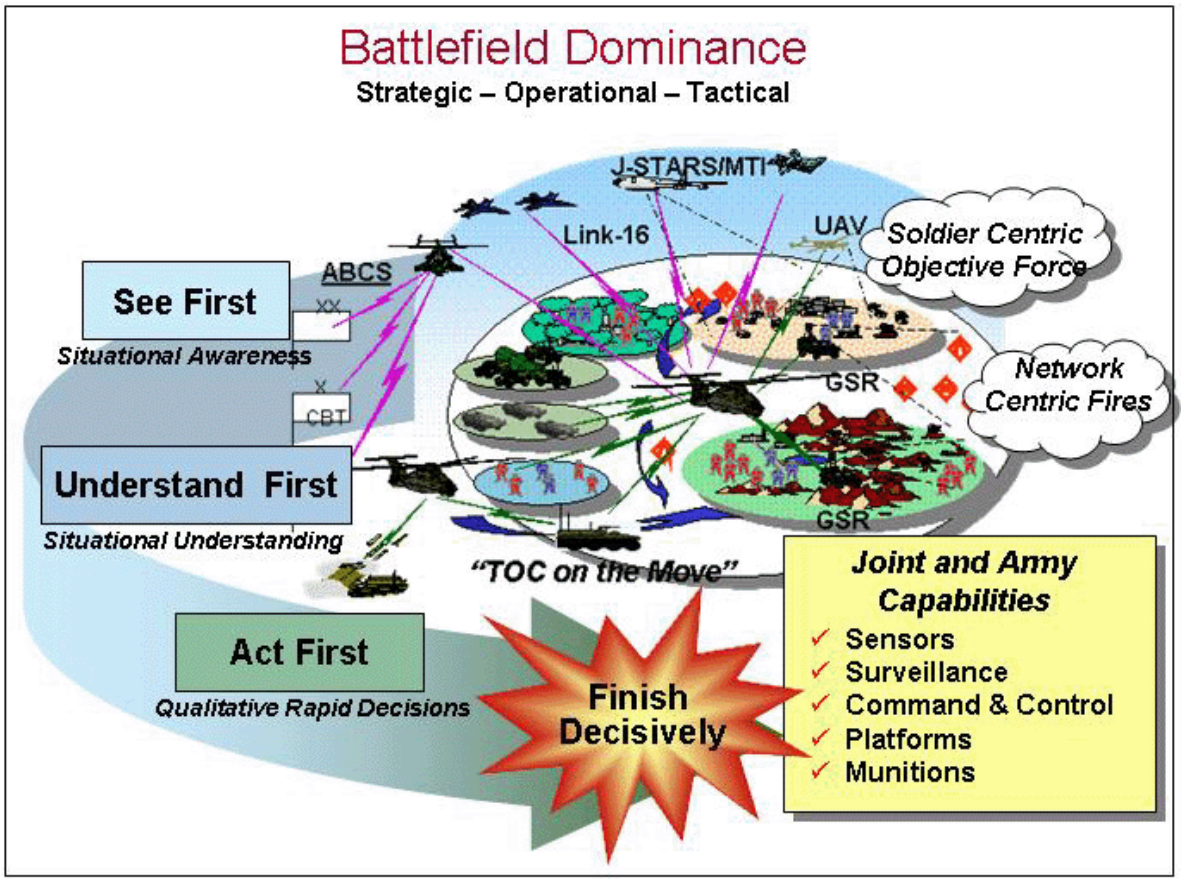


**Figure 8. Battlefield Dominance**

or forcing them into the open where they can be destroyed with joint fires. The psychological effects produced by the power and precision of Objective Force units will serve to deter hostile acts, both prior to deployment and during the stability phases of operations. The presence of Objective Force leaders and Soldiers, disposed across the battlespace yet operationally integrated through an information network, provides the JFC situational dominance in applying lethal and nonlethal effects with unprecedented precision across the spectrum of military operations.

Objective Force units will make significant contributions at all three levels of warfare: *strategic, operational and tactical*. At the *strategic* level, Objective Force units will continue to meet the Army's nonnegotiable contract with the American people to fight and win our Nation's wars. Objective Force units will also continue to provide the Army's unique contribution to national security: sustained land dominance across the range of military operations and spectrum of conflict. At the *operational* level, the Army provides headquarters that act as integrating agents within joint, interagency and multinational teams. Designated Objective Force headquarters and major commands will act as Joint Task Force (JTF) Headquarters, Joint Force Land Component Commands (JFLCC), and/or Army Service Component Commands (ASCC). For land campaigning, the Objective Force will provide operational level information superiority to JFCs, enabling them to gain and maintain operational initiative. Information superiority will be gained through operational level intelligence, surveillance, and reconnaissance (ISR); information management (IM); and information operations (IO). When coupled with Objective Force land campaign planning expertise, information superiority enables JFCs to see first, understand first and act first at the operational level.

The Army's ability to dominate the *tactical level* of war–the short sword warfight–upon which operational and strategic success is built, is essential for Joint Force success on land. Recognizing what is possible at the tactical level has been the subject for years of intense Army study and wargaming and, more recently, training enhanced with networked situational awareness within Legacy and Interim Force formations. Objective Force units will be optimized to win on the offensive, to initiate combat on their terms, to gain and retain the initiative, build momentum quickly and win decisively. They will be capable of mastering the transitions in warfare - - from fort to foxhole, from offense to defense, from warfighting to support operations - - that can sap operational momentum and threaten retention of the initiative. At the tactical level, Objective Force Units will *see first, understand first, act first and finish decisively* as the means to tactical success. Operations will be characterized by developing situations out of contact; maneuvering to positions of advantage; engaging enemy forces beyond the range of their weapons; destroying them with precision fires; and, as required, by tactical assault at times and places of our choosing. Commanders will accomplish this by maneuvering dispersed tactical formations of Future Combat Systems (FCS) and Objective Force Warriors (OFW), linked by web-centric C4ISR capabilities for common situational

dominance. With these capabilities, the Objective Force will master the transitions at all levels of operations.

See First. Objective Force units will see first by detecting, identifying, and tracking the individual components of enemy units. Advanced technologies that lead to unprecedented intelligence, surveillance, and reconnaissance capabilities coupled with other ground, air, and space sensors networked into a common integrated operational picture will enable forces to see the enemy, both in whole and in part, as a complex, adaptive organization. Data fusion systems, the Joint Global Information Grid, and leader training will enable decision makers to have a synthesized, common picture of the battlefield, the common operational picture (COP). These advanced technologies will be complemented by transformed Army Special Operations Forces, which will serve the Nation as "global scouts". These forces will provide networked feeder information to the COP regarding the geography of the battlespace, enemy and friendly forces, critical mobile and fixed targets at various ranges, in all weather and terrain.

Understand First. Using the COP, Objective Force commanders will be able to leverage the intellect, experience, and tactical intuition of leaders at multiple levels in order to identify enemy centers of gravity (COGs) and conceptualize solutions. As commanders decide on a course of action, they instantaneously disseminate their intent to all appropriate levels, affording maximum time for subordinate levels to conduct requisite troop leading procedures. The time gained through effective use of these information technologies permits Objective Force units to seize and retain the initiative, building momentum quickly for decisive outcomes.

Act First. Seeing and understanding first gives commanders and their formations the situational dominance necessary to act first--to engage at times and places with methods of their own choosing. Objective Force platforms and systems will be capable of moving, shooting, and reengaging faster than the enemy. Target acquisition systems will see farther than the enemy in all conditions and environments. Units will be able to rapidly assess options, act first by understanding when and where they must transition between actions, and remain fully synchronized throughout execution. The design is to deny the enemy any respite or opportunity to regain the initiative while Objective Forces operate at high operational tempo inside their opponent's decision cycle. Leveraging the COP, Objective Force units rapidly learn of actions, understand the impacts, and then synchronize their own actions--self-synchronization.

Finish Decisively. Objective Force units finish decisively by destroying the enemy's ability to continue the fight and achieving dominance quickly. Objective Force units do this by building momentum and rapidly transitioning to assault and exploitation operations without allowing the enemy time or opportunity to regroup and continue the fight on its terms. Units will maneuver by both ground and air to assume tactical and operational positions of advantage through which they will continue to dominate the enemy and pursue subsequent campaign objectives. Objective Force units will continue to exploit the initiative until they have broken

the enemy psychologically and/or physically, thus achieving decisive victory.

Critical to the Objective Force's ability to "See First, Understand First, Act First and Finish Decisively" at the strategic, operational and tactical levels is a force design founded on a set of characteristics that provides the Force with the capability to be strategically responsive and dominant at every point on the spectrum of military operations.

## Objective Force Characteristics

These seven characteristics of the Objective Force are complementary features that together produce an overall capability greater than the individual capabilities they describe. These characteristics arise from the Vision's goal and the likely shape of the future international security environment. In turn, they provide the analytical foundation for developing the concepts, doctrine, and systems that will constitute the Objective Force.

Responsive. Responsiveness embodies time, distance, and sustained momentum. The Objective Force must be *responsive* to allow the Army to meet frequent contingency requirements with any element of the force. To be responsive requires the ability to put forces where needed on the ground, supported by air and naval forces, to directly affect the outcome of the situation or crisis at hand within hours of a decision. The forces deployed must be prepared to accomplish their mission regardless of the environment, the nature or scope of the proposed operation, or other commitments. They should have a demonstrated capability to deter the prudent adversary, as well as to influence and shape the outcome of the crisis. If required, they should have the ability to employ force from low to high-intensity. Responsiveness applies to more than just operational forces; the entire mobilization process must be responsive in order to ensure the availability of the entire force in a timely manner. (*Figure 9)*

Deployable. To achieve this responsiveness, Objective Force units must be *deployable*. These units must be capable of rapid strategic movement to create the opportunity to avert conflict through deterrence and confront potential adversaries before they can achieve their goals. Designing an Objective Force platform weighing less than 20 tons and capable of fitting a C-130-sized cargo envelope will facilitate the requirement to have a combat brigade on the ground within 96 hours after liftoff, a division within 120 hours, and five divisions within 30 days. Accomplishment of these aggressive deployability requirements means the Army will need support from the other Services, particularly in the availability of vital strategic lift assets such as the C-17 aircraft and fast sealift. With that support, the Army will be able to provide an unprecedented level of ground force dominance.

Agile. Because of the broad range of missions that will be assigned to U.S. forces, often in highly volatile situations, Army forces must be able to shift intensity of operations without augmentation, a break in contact, or additional training. Today's forces possess the *agility* to shift seamlessly from offensive to defensive to offensive operations on the battlefield. The Objective Force must replicate that

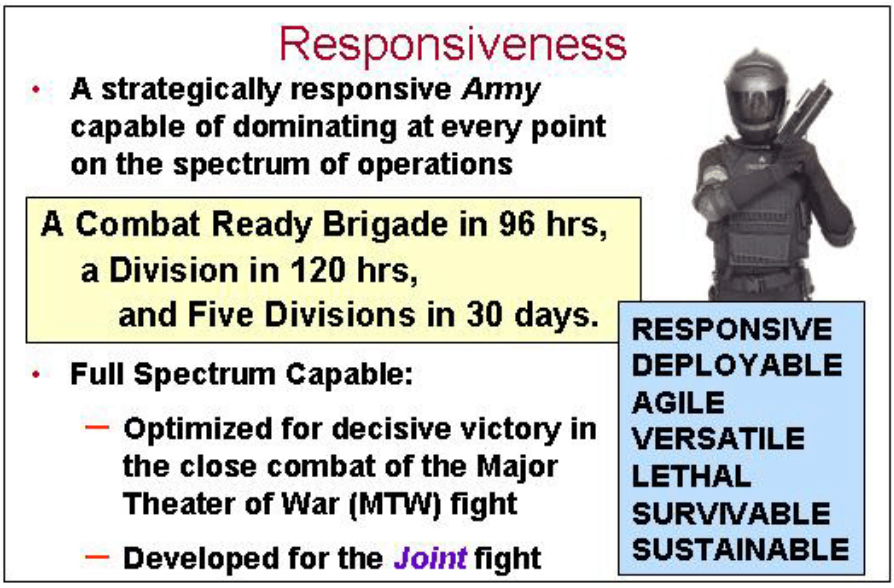


**Figure 9. Responsiveness**

same agility in a much broader, full spectrum context within entire theaters of operation. These forces will frequently be called upon to transition from non-combat disaster relief to low-intensity contingencies to high-intensity warfighting with little or no time to change mindset or organizational design. The agility to make these transitions without losing momentum is a function of our people. The Army will develop it through leadership and training.

Versatile. *Versatility* describes the inherent capacity of Objective Force formations to dominate at any point on the spectrum of military operations *(Figure 10).* The Objective Force will be designed for full spectrum success while optimized for major theater war. The force design means that formations will possess the inherent versatility to operate effectively anywhere on the spectrum of military operations without substantial augmentation to perform diverse missions within a single campaign. As technology produces the breakthroughs necessary for the Objective Force, distinctions between heavy and light forces will blur. Special purpose capabilities previously associated with today's heavy or light formations--to include vertical maneuver capability--are designed into Objective Force formations. These units will possess the lethality, speed and staying power associated with heavy forces and the agility, deployability, versatility, and close combat capability of today's light forces. While The Army will retain certain special purpose capabilities and units, the majority of the force will be combined arms and full spectrum capable.

Lethal. Objective Force *lethality* will exceed that of today's conventional heavy forces. Through technological improvements in weaponry and munitions, the Objective Force will have the capability to destroy enemy formations at longer ranges, with smaller calibers, greater precision, and more devastating target effects. Key enablers include organic line of sight, beyond line of sight, and non-line-of-sight fires. These fires will overmatch the enemy in all conditions and environments and be


**Figure 10. Operational Spectrum**

based on one shot–one kill disciplines and designs. New propellants and materials will permit smaller caliber penetrators, and, together with increased accuracy, reduce ammunition weight, opening new possibilities for system as well as unit agility. Embedded intelligence will enable selective engagement of those targets whose destruction creates the greatest effects on the enemy force.

Survivable. The Objective Force will take advantage of technologies that provide maximum protection and *survivability* down to the individual Soldier level, on or off platforms (*Figure 11*). The agility of our formations combined with the common operating picture is critical to maximize survivability. Ground and air platforms will leverage the best combination of low observable, reduced electronic signature, ballistic protection, long-range acquisition, early discrete targeting, shoot first every time, and target destruction each time we pull a trigger. Objective Force survivability will be linked to its inherently offensive orientation, as well as its speed and lethality. By seizing the initiative and seeing, understanding, and acting first, the Objective Force will enhance its own survivability through action and its retention of the initiative.

Sustainable. Our forces must retain the capability to continue operations longer than any adversary the Army confronts. This is a critical aspect of equipment superiority. *Sustainability* is directly linked to responsiveness and deployability. Careful planning and discipline is essential to deploy only those forces and systems needed to ensure dominance at every point on the spectrum of operations. Sustainment requirements will be reduced, where possible, by minimizing forces deployed into the area of operations through split basing and the use of technology to provide reach capability. Host nation and allied support for our forces can also reduce

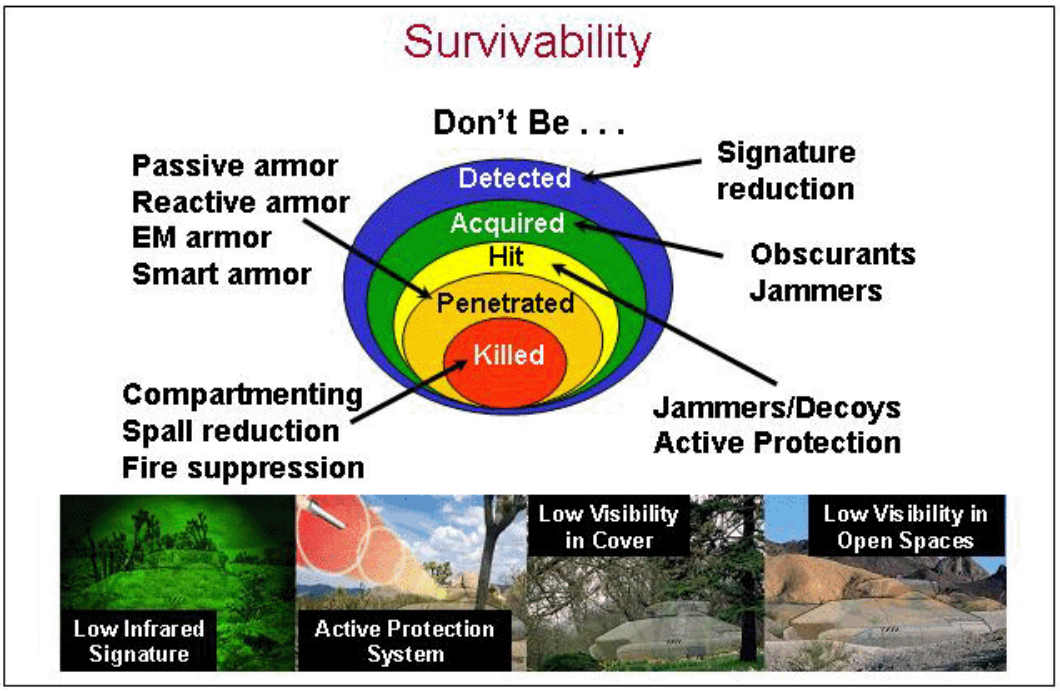


**Figure 11. FCS Survivability**

sustainment requirements, but the Army must be able to operate unilaterally if necessary. Consequently the Army must continue to find ways to exploit advanced technologies and reduce the logistics footprint and related costs of our support structure.

As it transforms itself into the Objective Force with the characteristics described above, the Army will remain a values-based force that derives its greatness from its people. The Army will continue to attract, train, motivate, and retain the most competent and dedicated people in the Nation to fuel our ability to be persuasive in peace and invincible in war. The Army will invest in training, educating, and equipping our Soldiers and civilians while providing them and their families with the well being necessary to make the Army a rewarding and fulfilling profession. Providing our Soldiers and leaders with a strong physical, mental, and moral foundation will enable them to act decisively while conducting full spectrum operations in the complex environments they will surely face.

In sum, the Vision points to a synergy that will revolutionize the effectiveness of the Army in order to match its capabilities with the Nation's strategic requirements. The Army intends to reduce or even eliminate the current distinctions between the light and heavy units. Anticipated technological improvements will enable new organizational and operational concepts that optimize the employment of Army and joint capabilities across the full spectrum of operations. The versatility inherent in these organizations will be magnified through the training and leadership of our high quality men and women, who will be prepared to transition from disaster relief to low-intensity contingencies to high-intensity warfighting without pause. Applying the Objective Force design across the Army will improve our overall capability, help alleviate operational tempo (OPTEMPO) and personnel tempo (PERSTEMPO)

challenges, and enhance the Nation's capacity to sustain long-term commitments while responding to frequent contingencies.

## The Interim Force

Establishing the Interim Force fills the strategic near-term capabilities gap between Army heavy and light forces. It leverages today's state of the art technologies to bridge the capabilities gap between the Legacy Force and the arrival of the Objective Force and to provide more flexible options for the regional CINCs. Interim Force units are designed to be operationally effective at both the low end of the spectrum—peacekeeping, security-building and support operations, and smaller-scale contingencies—as well as the high end of the spectrum. They will also serve as an indispensable vanguard for the future Objective Force by validating operational and organizational concepts, training and leader development initiatives, and deployment scenarios.

The IBCT is the cornerstone of the Interim Force. Two Army brigades, one heavy (3rd Brigade, 2d Infantry Division (3/2 IN)) and one light (1st Brigade, 25th Infantry Division (1/25 IN)) have been reorganized at Fort Lewis, Washington into an IBCT configuration. The Army plans to convert at least six brigade combat teams to an IBCT configuration. Extension of the Interim design from an IBCT to an Interim Division is currently being developed and modeled by the Army's Training and Doctrine Command (TRADOC). In addition the Army has recognized the requirement for a cavalry function in both the current and future operational environment. TRADOC is presently developing the organizational design for an Interim Cavalry Regiment.

Transformation to the Interim Force is occurring now with the conversion of 3/2 IN and 1/25 IN. Interim Force units will be among the last in the Army to change to an Objective Force design.

### Interim Brigade Combat Team

The Interim Force is based on the foundation of an IBCT equipped with a family of Interim Armored Vehicles (IAVs), lightweight artillery, and other available advanced technology. This technology will include Land Warrior systems that will be integrated into the IBCTs and significantly enhance the common situational awareness for Soldiers. With a total of at least six IBCTs, the Army will offer the joint and multinational force commander increased operational and tactical flexibility to execute any required fast-paced mission using units deployable in C-130 or equivalent aircraft.

The IBCT's two core qualities are increased mobility (strategic, operational, and tactical) and its ability to achieve decisive action through dismounted Infantry assault. Its core operational capabilities rest upon increased operational and tactical mobility, enhanced situational understanding, combined arms integration down to company level, and increased Infantry strengths for close combat in urban and complex terrain.

In the spring of 2000, Congress approved funding for the first two IBCTs. Congress displayed further support of the IBCT concept with an additional $600 million for IAV procurement in the FY 2001

Defense Appropriations Act. The Army will program resources to field six IBCTs. The first two IBCTs, 3/2 IN and 1/25 IN, are expected to complete their transformation no later than FY03 and FY04, respectively, with the fielding of the recently selected IAV.

In July 2001, the Army announced the next four brigades to transform into IBCTs: the 172nd Infantry Brigade (Separate) at Forts Richardson and Wainwright, Alaska; the 2nd Armored Cavalry Regiment (Light) at Fort Polk, Louisiana; 2nd Brigade, 25th Infantry Division (Light), at Schofield Barracks, Hawaii; and the 56th Brigade of the 28th Infantry Division (Mechanized), Pennsylvania Army National Guard.

As part of the Interim Force transformation process, an IAV-equipped battalion-sized element will undergo training and initial operational testing and evaluation to determine system suitability and effectiveness. Innovative applications and technology insertion in supporting forces will complete the IBCT package and enable initial operational capabilities for the first IBCT in early 2003.

The transformation to the IBCT design is projected to take one to two years for an active brigade, and the Army expects that the National Guard brigade will take up to five years due to the difference in tempo between the two organizations (*Figure 12*).

These interim brigades will increase the momentum of Army Transformation to the Objective Force, a force that is more strategically responsive and dominant at every point of the operational spectrum. The Army continues to refine the appropriate mix of organizations and capabilities needed in the Interim Force. This includes consideration of an Interim Cavalry Regiment that combines the

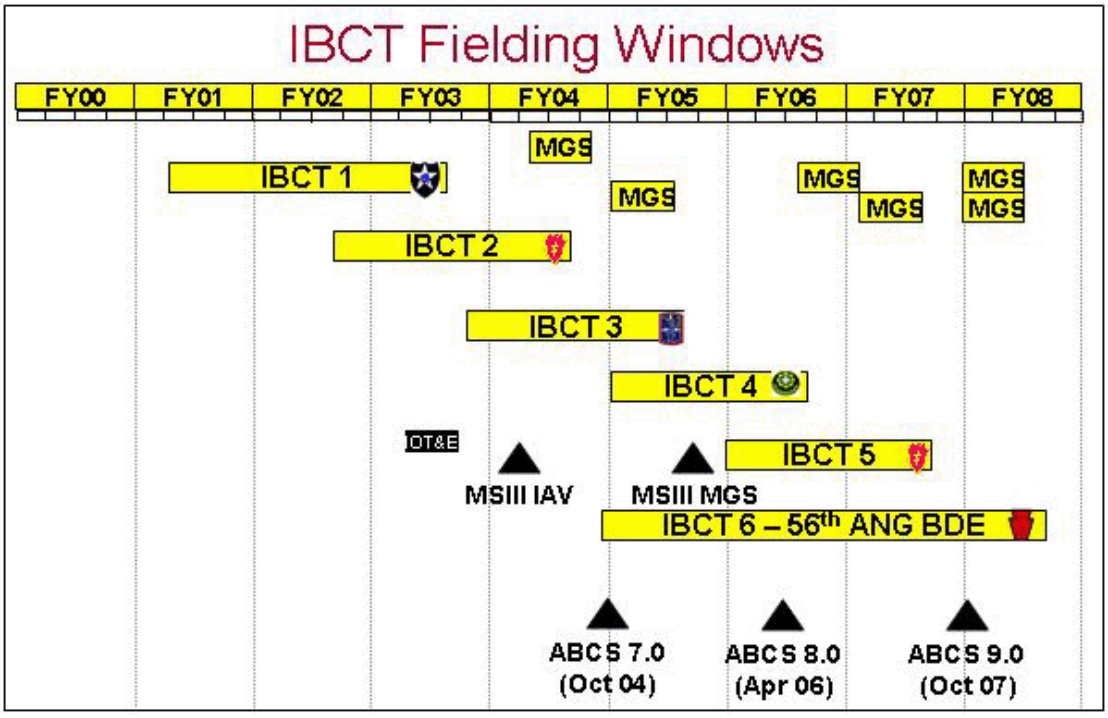


**Figure 12. IBCT Fielding**

deployability of an IBCT with the operational capabilities of a traditional cavalry regiment.

## The Interim Division and the Interim Cavalry Regiment

Studies suggest that IBCTs, although designed for easy integration into light or heavy divisions, are even more flexible and tailorable to the joint fight when subordinated to an Interim Division. Such a structure provides a strategically responsive force capable of initiating earlier decisive operations, coordinating multiple, simultaneous stability and support operations (SASO) and small-scale contingencies (SSC) requirements, providing the C4ISR and precision fires that enable precision maneuver and information superiority and functioning as an Army Forces (ARFOR) Headquarters in joint operations.

The Army continues to refine the Interim Division organization and operational concept while it weighs the option of converting a current Army division to the Interim design, possibly prior to 2008.

Recognizing the immediate need to provide effective command and control for an IBCT, the Army is also analyzing the establishment of a detachable, deployable cell that would provide for higher control (HICON) of an IBCT until such time that an Interim Division has attained initial operational capability. The HICON element will be a cost-effective solution designed to act as a "digital bridge" between the IBCT and the next higher-level headquarters. A properly designed and resourced HICON will allow the IBCT commander to effectively command and control his unit while the digitally-linked HICON interfaces with the Joint Task Force or Army Force Commander (ARFOR). The Army intends to establish a HICON capability concurrently or just prior to the first IBCT's (3/2 IN) initial operational capability, currently scheduled for 2003.

As the Army continues to examine Interim Force requirements, it conducts modeling and simulation to ensure the organizational construct is sufficient to decisively defeat a robust enemy force. As part of the analytical effort, the Army has validated the need for a cavalry force. Initial insights have led the Army to refine the basic IBCT design and establish a new organizational design: the Interim Cavalry Regiment (ICR). The ICR will fulfill the emerging cavalry roles articulated in FM 3.0 *Operations*. The Army is considering converting one of the previously identified brigade combat teams to an ICR and will announce a decision in late FY02.

The current operational environment demands a decisive ground combat capability that can rapidly deploy to any global contingency and effectively operate once it arrives in theater. The Army recognized the need for this capability and has made significant progress in developing an Interim Force that fills the requirement. Today, Army Soldiers in Fort Lewis, Washington, are well on their way to providing the President and the Secretary of Defense with a new and powerful capability—the IBCT.

## Legacy Force

Modernization and recapitalization of the current Army force—the Legacy Force—

is at the heart of addressing readiness. The Legacy Force continues to provide the strategic insurance policy for the Army's responsibility to fight and win decisively against any threat while the Army transforms. Army Transformation timelines clearly show elements of the Legacy Force remaining within the Army's force structure for the next 25-30 years. Within that context, the Army will continue to rely upon the Legacy Force to fight and win conflicts well into the fielding of the Objective Force, which begins in FY08. For that reason, resources must be devoted toward the recapitalization and limited modernization of the Legacy Force while the Army successfully transforms itself. The Army will direct toward the Legacy Force the amount of resources that is needed to maintain combat superiority over any potential enemy as well as the superior ability to project power rapidly at strategic depths.

The Army recognizes the reality of resource constraints and is prepared to accept risk in the current force in order to allow the investment required for the future force. This risk, however, must be continually reviewed to ensure that current readiness requirements are always met, especially in light of critical and often unexpected needs that arise, such as with the dramatic new demands following the 11 September 2001 terrorist attacks.

An important element of the Legacy Force is the requirement for an offensive or counteroffensive capability for use in a major conflict. Assembling the ground force required for decisive counteroffensive operations anywhere in the world calls for a three-division corps, with an armored cavalry regiment. To meet this need, the Army is selectively modernizing and recapitalizing III Corps (designated as the Army's Counterattack Corps), which consists of the 3rd Armored Cavalry Regiment and three active duty heavy divisions: the 1st Cavalry Division, the 4th Infantry Division and the 3rd Infantry Division. Also included are those echelons above division (EAD) units assigned to III Corps, including Reserve Component units.

The insertion of digital technology and better capability to manage knowledge will move the modernized Legacy Force organizations toward the kind of warfighting ability to see the battlefield, anticipate requirements and handle transitions that will characterize the Objective Force. In that sense, the Army's Modernization Strategy begins to develop future leaders who can employ the Objective Force in ways that maximize its potential.

The forward-deployed and early deploying contingency forces, along with the prepositioned equipment sets that support them, will be recapitalized and selectively modernized as needed within available resources. Reserve Component forces will maintain capabilities compatible with the units that they support through the selective cascading of equipment from Active Component forces in the near-term and more extensive cascading of Legacy Force equipment in the mid to long term. The difficult decisions made to fully fund Objective and Interim Force programs, resulting in the reduction in the overall Legacy Force recapitalization and modernization effort, delay the modernization of the Reserve Component forces that rely on cascading. This delay is a necessary level of risk required to

meet the Army's Vision of a future transformed force.

## Synchronizing Transformation–The Army's Transformation Campaign Plan

The Army Vision represents the goals for the Army, while the Transformation and the accompanying TCP is the vehicle for becoming more strategically responsive and dominant across the full spectrum of military operations. The TCP, which is developed, coordinated, and maintained by the Army G3, ensures the synchronization of the Transformation process with the day-to-day management of the Army. In brief, this campaign plan is the institutional synchronizer and road map for achieving the Army Vision.

Achieving the Vision requires the comprehensive transformation of the entire Army including both the Operational Force and Institutional Army. The general concept of operations mandates that the Army implement the Vision through Transformation as rapidly as possible, while continuing to sustain warfighting readiness.

The Army is pursuing an objective-oriented, condition-based strategy wherein Transformation proceeds in accordance with a series of decisions. The TCP contains three major objectives and four major decision points that guide the Army's Transformation efforts. The major objectives are the Initial Force, the Interim Force, and the Objective Force. The four major decision points are: IAV Selection, Transition from Initial Phase to Interim Capability Phase, Extend the Interim Design Beyond Brigade Echelon, Transition the Interim Capability Phase to Objective Capability Phase.

The TCP is a three-phased plan with phases corresponding to the three major objectives. In addition, there are three axes: Trained and Ready, Transforming the Operational Force, and Transforming the Institutional Army. These serve as the framework for the execution of the TCP. These axes are further divided into Lines of Operation, which provide the ability to synchronize and integrate the transformation effort across the Army. (*Figure 13*)

Annex B to the TCP is the Synchronization Matrix, a software tool for synchronizing the transformation activities of the Army. It contains the objectives, decisions points, milestones and events. The key institutional processes inside and outside the Army are included in the Synchronization Matrix. These processes are displayed as key input/output events distributed over time. The Army Transformation Office within the Army G3 maintains the Synchronization Matrix. The staff proponent for each of the Lines of Operation is responsible for updating the data in the Synchronization Matrix.


**Figure 13. TCP**

## Exercises and Experimentation

The Army's experimentation and its participation in Joint Concept Development and Experimentation (JCD&E) will play a key role to shape Transformation and demonstrate capabilities. Joint and Service experimentation is a focus of DoD planning guidance, and the Joint Forces Command (JFCOM) is the executive agent for joint experimentation.

JFCOM experiments with future joint concepts that the Services will explore over a six-year period and sets the conditions for the Services' participation in joint experiments. Consequently, JFCOM reports the results of the concept experimentation to the Secretary of Defense and Congress. The TCP is the primary tool to manage the Army's contributions to joint experimentation.

Force XXI experimentation on the Legacy Force culminated with the Division Capstone Exercise (DCX). The purpose of the DCX was three-fold: to demonstrate the "go to war capability" of the 4th Infantry Division (Mech) in 2001, demonstrate the relevance of heavy forces in the National Military Strategy, and demonstrate C4ISR functionality in a realistic environment. The DCX was conducted in two phases. DCX Phase I was conducted in April 2001 at the National Training Center (NTC) to demonstrate and assess the 4th ID's Force XXI Heavy and Aviation Brigades' ability to contribute decisively to III Corps'

land campaign counteroffensive capability. DCX Phase II was conducted in October 2001 at Fort Hood and central Texas to demonstrate 4th ID's warfighting capabilities enabled by modern warfighting doctrine, structure and systems as the decisive element of a Corps counteroffensive in a joint campaign. Results from the DCX will support modernization and recapitalization of the Legacy Force, lead to improved capabilities for the Interim Force, and provide insights for Objective Force development. *(Figure 14)*

While the Interim Force, including the IBCTs at Fort Lewis, is not an Experimental Force (EXFOR), both the Secretary of the Army and Chief of Staff have stated that Interim Force elements may be made available for Army and joint experiments. Interim Force elements can provide a "bridge" to Objective Force capabilities that will eventually be portrayed in Army and joint experiments during the Transformation process.

Millennium Challenge 2002 (MC02) is a Congressionally-directed Joint Experiment that will be held 24 July through 16 August 2002. It will involve live and simulated capabilities at various sites in CONUS to explore critical war-fighting challenges at the operational level that will confront the U.S. military forces this decade. The purpose of the Army experiment supporting MC02, called Army Transformation Experiment 2002 (ATEx 02), is to assess the following hypothesis: "If land component and joint force commanders are provided a transforming Army force (consisting of Legacy and Interim Forces) that employs advanced enablers across the DTLOMS, then they will have enhanced capabilities to dominate and force early termination through rapid decisive operations with full spectrum dominance."

The Concept Experimentation Program (CEP) is a TRADOC sponsored activity designed to provide analytical evidence refining emerging concepts and requirements. Experimentation is


**Figure 14. DCX**

conducted on specific topics and focused on Army priorities in support of Objective Force development. CEP experimentation in FY02 and FY03 is designed to underpin specific requirements for the FCS. Each CEP is assigned a lead Army Battle Lab responsible for the overall effort, but supported by other Battle Labs as necessary to ensure a total Army focus. The FY02 CEP experiments are; the Unit of Action CEP (Mounted Maneuver Battle Lab lead), Shaping the Battlespace CEP (Depth and Simultaneous Attack Battle Lab lead), Objective Force Sustainment CEP (Combat Service Support Battle Lab lead), Commander's Information Cell CEP (Battle Command Battle Lab [Leavenworth] lead), and the Unit of Action Intelligence, Surveillance and Reconnaissance CEP (Battle Command Battle Lab [Huachuca] lead).

The Army's experimentation strategy will lead to a program that is designed to integrate Objective Force development across the DTLOMS in a joint context. The program will consist of a series of Army experiments and participation in major joint experiments, gradually increasing in scale, to support development of DTLOMS products for Objective Force Unit of Action, Unit of Employment, plus integration of Objective Force capabilities into the JCD&E process. The program also includes Capstone Exercises as required to demonstrate significant increases in warfighting capability. Experimentation remains a key-supporting element of Army Transformation by acting as an integrating mechanism to enable Objective Force development as part of the joint force.

# Army Modernization

Modernization is a continuous process of integrating new doctrine, training, organizations, and equipment to develop and field the capabilities the Army needs to fulfill its responsibilities in executing the National Military Strategy and all assigned missions. Modernization activities are facilitated and optimized by sound Modernization and Investment Strategies that are specifically designed to implement the Army's Transformation process. The Modernization and Investment Strategies also establish common terms of reference for all modernization activities, and, very importantly, provide clear priorities and focus for the allocation of resources for equipment expenditures.

The overall Army Modernization Strategy remains focused directly on support to Transformation to ensure that those capabilities essential for the future are being developed. Simultaneously, it provides those necessary capabilities for the current force, which remains the foundation of the Army's readiness to fight and win decisively against any threat for the next fifteen or more years.

The Investment Strategy in support of modernization describes the process used in deciding how to allocate monies across competing priorities in order to obtain the best capability for each dollar spent.

## Modernization Strategy—Balanced Modernization

In support of the overall goal of implementing Transformation of the Army into a more responsive and capable force for the future, the Army has developed a coordinated and comprehensive strategy of focusing all its efforts and programs on equipping and organizing forces. This strategy can be described best as one of "balanced modernization", which seeks to develop and field combat-capable units through an appropriate mix of selective procurement and fielding of new equipment (modernization), rebuilding and upgrading of key existing equipment (recapitalization), and preserving needed elements of current equipment (maintenance). As instruments for the most efficient use of these various means, the Army also has two important processes—Unit Set Fielding and Software Blocking—which are designed to ensure achievement of the greatest combat capability across the force throughout the overall modernization process.

The Modernization Strategy also consists of the following three components, which help define a clearer focus for its implementation (*Figure 15*):

- S&T efforts to enable timely fielding of the future Objective Force, and, in particular, the FCS, which will be the foundation of that force.
- Fielding of immediate operational capabilities in a more responsive yet still lethal force by organizing and equipping brigade-sized units outfitted with a series of new interim combat vehicles.
- Maintaining and improving essential

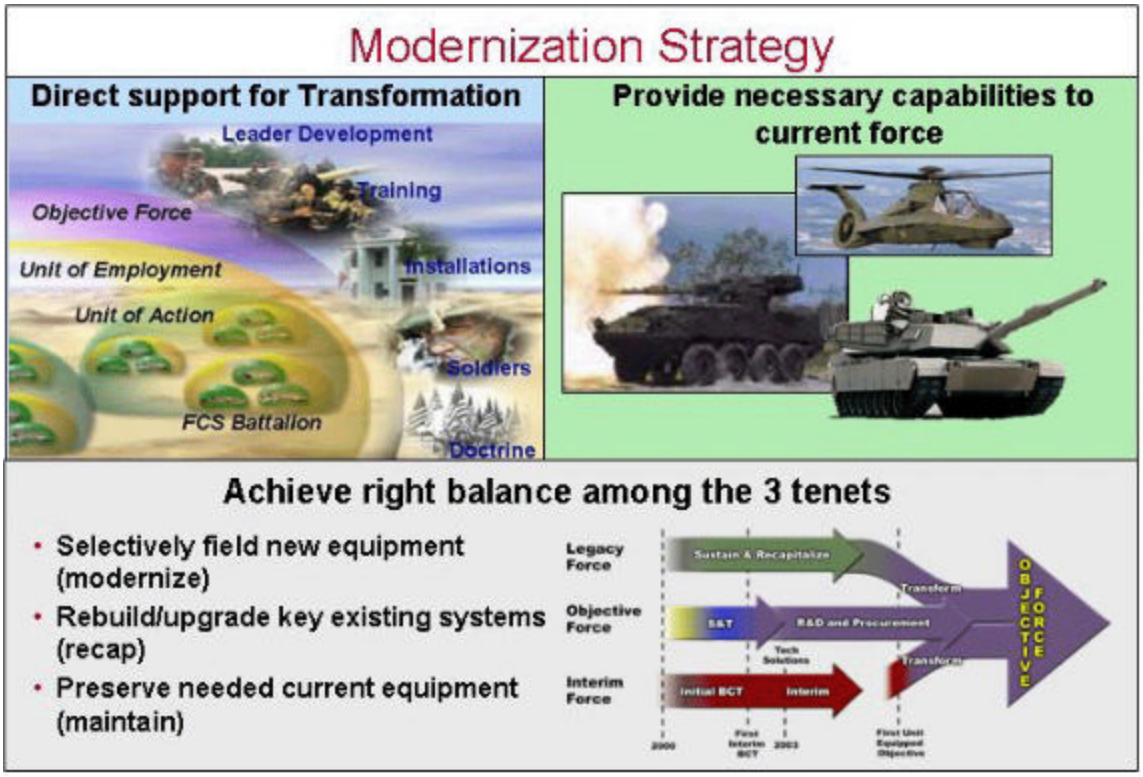


**Figure 15. Modernization Strategy**

warfighting capabilities of the existing forces needed to preserve appropriate military superiority for all possible missions.

Ultimately, the Army will have a common organizational design for all of the Components—Active, Guard, and Reserve—built around a new generation of systems that are deployable on C-130-like aircraft, though with optimum deployment on C-17 aircraft and fast sealift. The desired end state is a more strategically responsive Army that is more capable of dominance along the full spectrum of military operations in a joint and combined environment.

## Balancing Modernization across DTLOMS

Army Transformation mandates a comprehensive examination of the interrelationships between doctrine, training, leader and Soldier development, materiel, organizations, and facilities. As the Army fields new capabilities to the Legacy Force, begins the fielding of the Interim Force and develops the Objective Force, it must optimize investments by ensuring the proper synchronization between DTLOMS requirements and DTLOMS solutions.

Today, the Army has in place at Fort Lewis a special team of personnel who are crafting the doctrine, tactics, techniques and procedures for the IBCTs. Concurrently, it is examining organizational designs and developing a new how-to-fight doctrine for an Objective Force designed to See First, Understand First, Act First and Finish Decisively.

The Army's Training and Doctrine Command, conducting a comprehensive review of Army training, is currently formulating a new Training and Leader Development Model that is based on Army Culture: established standards for Soldiers, leaders and units; feedback at all levels from the individual Solder to Department of the Army Headquarters; and a balanced operational and educational experience through the proper rotation and sequencing of assignments, schooling, and self-development.

Transformation has placed new demands on the Army's management of Soldiers and leaders throughout the force. With over one million Soldiers geographically dispersed across seven continents, the Army's personnel community is developing new tools that will ensure the right Soldiers with the right skill sets are assigned to the proper units in a timely manner to ensure combat readiness. Enhanced personnel databases, leveraging web-based technologies, and implementing best business practices are examples of how the Army intends to improve the management of its military and civilian personnel.

The ultimate goal of our modernization effort is to produce highly capable organizations with technologically superior equipment, manned by well trained personnel, led by leaders who are fully aware of and able to employ their organizations' potential in accordance with a solid doctrinal foundation. Modernizing the Army with new systems and equipment is a critical undertaking that consumes vital and limited resources. Only by ensuring that equipment fielding is coordinated and synchronized with total

requirements can the Army be assured that resources are being used in a wise and cost-effective manner. The annexes attached to the 2002 Army Modernization Plan provide a comprehensive and succinct review of the progress being made modernizing across DTLOMS as the Army transforms itself to the Objective Force.

## Modernization Priorities

To implement the Modernization Strategy in support of Transformation, the Army prioritizes its investment of limited resources over time. The number one priority for Army modernization investments is the development of the future Objective Force and particularly the FCS, the foundation of the future transformed Army. Initially that investment takes the form of S&T efforts to explore, identify, and develop the revolutionary technologies needed to make the FCS a reality. Of the Army's total S&T funding, over 95% directly supports programs needed to develop Objective Force technologies. In addition to these S&T efforts, the Army is also devoting a substantial and increasing amount of its RDA funding to fielding systems that will be fully integrated in the Objective Force.

Developing and fielding the future Objective Force is the Army's modernization investment priority, and 70% of RDA funding in the FY03-07 Plan supports this purpose. Fully 20% of RDA is directly earmarked for systems that will be integral to the Objective Force. Over 50% of total RDA is earmarked for Legacy Force systems that will transition to and remain part of the Objective Force, and only 16% of RDA funding will be used by systems associated solely with the current Legacy Force. The preponderance of funding focused on the Objective Force will continue to increase over time as the Army progresses in the Transformation process.

The focus on the future force is, in fact, enabled by the Army's continued investment in the readiness and capability of the Legacy Force and in the fielding of the smaller Interim Force, for which about 4% of RDA funding is devoted. As the Objective Force units are fielded and become operationally capable, beginning in 2010, the change in investments will accentuate even further. In recent years the Army has begun a paradigm shift in its investments toward an increasing emphasis on leap-ahead technologies needed for the future. This shift will continue in the coming years, though the Army will still have to balance sufficient investments in near-term capabilities until future formations and systems can be fielded. (*Figure 16*)

In order to accelerate Transformation to the future Objective Force, the Army has accepted risk by focusing its modernization efforts on selected units and capabilities.

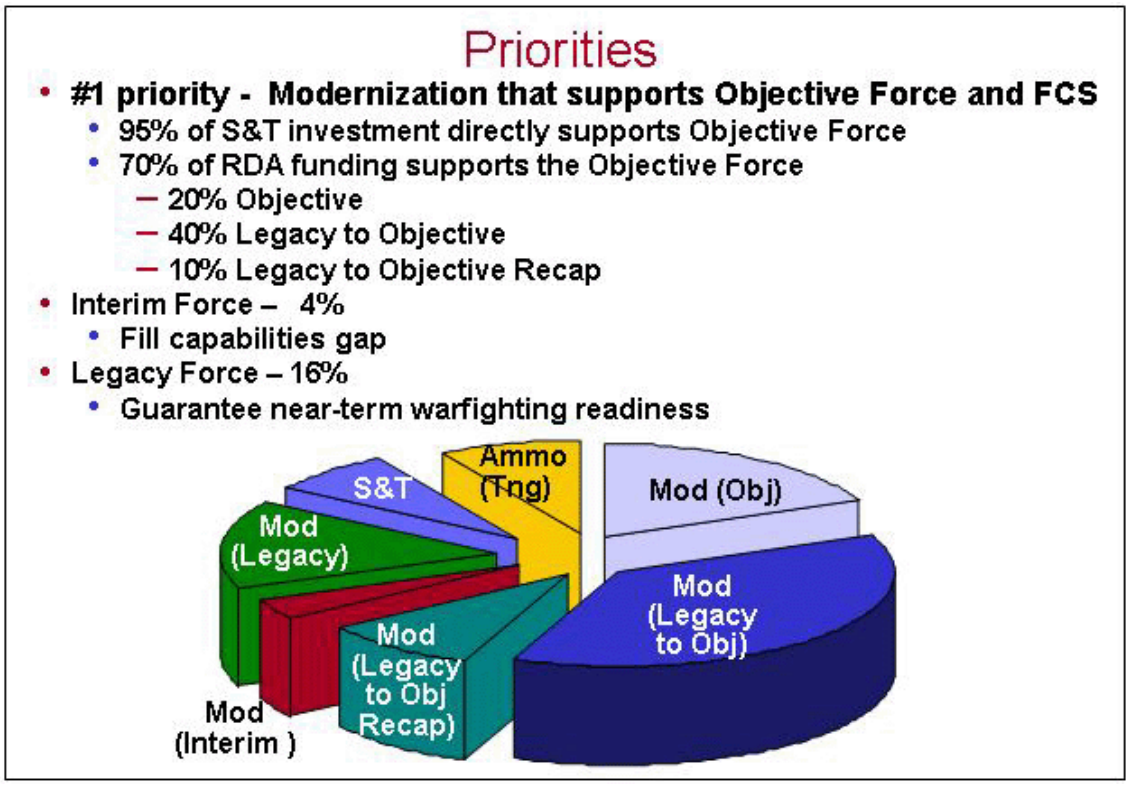


**Figure 16. Modernization Priorities**

## Equipping Categories

Programs are placed into three basic categories as follows:

*Modernization:* The development and/or procurement of new systems with improved warfighting capabilities.

*Recapitalization:* The rebuild and selected upgrade of currently fielded systems to ensure operational readiness and a near zero time/zero mile system.

*Maintain:* Repair or replacement of end items, parts, assemblies, and subassemblies that wear or break.

## Modernization Processes

As already mentioned, there are two important processes that are integral to the execution of the Army's Modernization Strategy—Unit Set Fielding and Software Blocking. In addition to these processes, the Army also makes extensive use of simulation and modeling as well as of studies and analyses in order to help establish priorities and make informed choices throughout the Transformation process. Collectively, all of these processes and supporting tools are integral to the success of Transformation and an effective and efficient Modernization Strategy. (*Figure 17*)

***Unit Set Fielding*** (USF) is a disciplined modernization process and strategy that results in fielding of an increased capability/function in support of the three

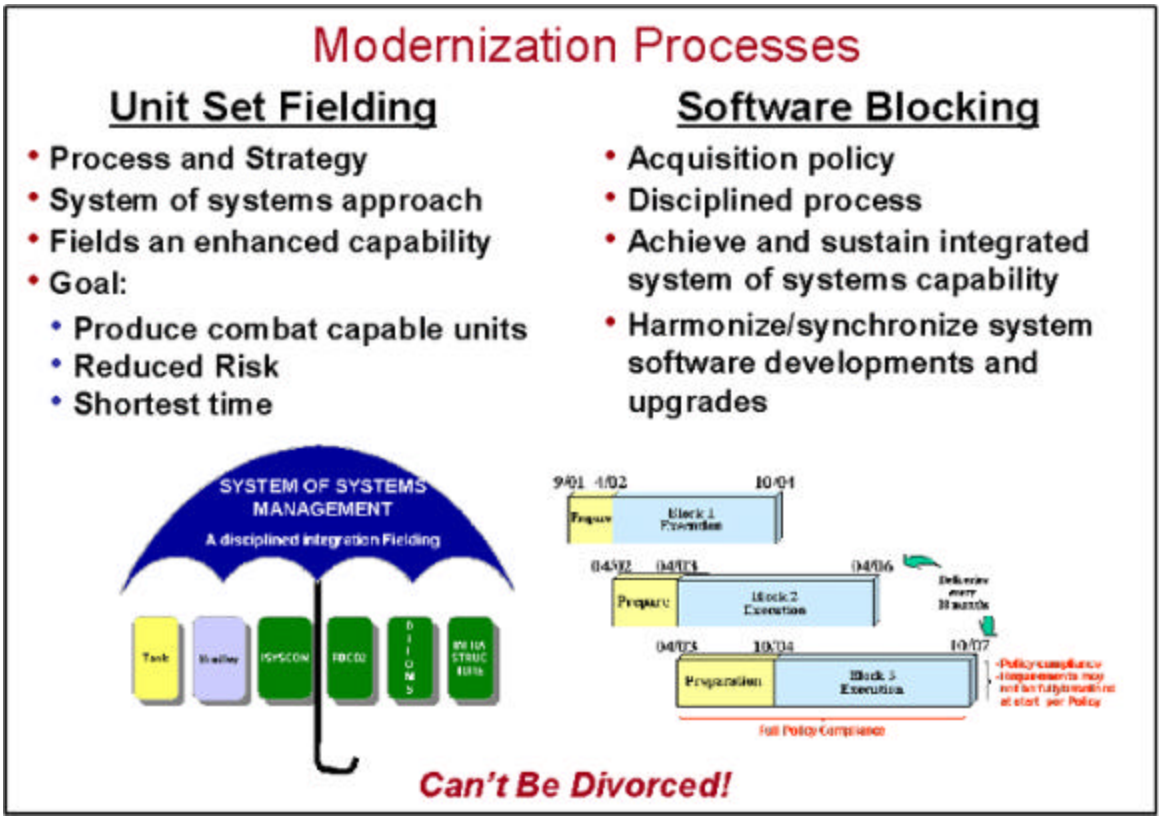


**Figure 17. Processes**

paths (Legacy, Interim and Objective) of Army Transformation. The USF process drives the integration and synchronization of multiple systems fieldings occurring during a defined fielding window to minimize the impact on force readiness; increase force effectiveness and streamline the fielding process. The fielding schedules to execute USF are focused on system interdependencies and operational and readiness impacts because readiness is the driver.

Current and future war fighting systems are interdependent and require interconnectivity to maximize their effectiveness on the battlefield. Therefore, to ensure efficient and effective fielding, the Army instituted USF as the process to assemble and issue individual and interdependent systems. However, this process may not be practical for all units and Components in brigade sets, particularly in the Reserve Components. Therefore, USF may be executed at battalion, separate company or team/detachment. As the result of USF, the Army ensures that the unit receives not just individual pieces of new equipment, but an enhanced war fighting capability.

Synchronizing equipment and software fielding by unit set increases efficiency and minimizes the disruption to the unit, as compared to the traditional method of unsynchronized fielding of individual systems. The traditional fielding system proved too disruptive to unit training and readiness as the Army transitioned to the digitized force. With the increased number of digitized and modernized systems being fielded, along with the accompanying successive software

upgrades, USF ensures these digitized systems, inherently designed to be used in a system-of-systems environment, create the intended synergistic effect. USF will produce combat units with far greater capabilities in the shortest period of time with minimum risk to operational availability. USF is currently being executed in support of 1st Cavalry Division (Legacy Force) and 1st Brigade, 25th Infantry Division (Interim Force).

For a unit to realize the full capability of new weapons, sensors, digital command and control systems, and corresponding training aids, devices, simulators and simulations (TADSS), equipment must be integrated, fielded, and upgraded as a unit set. The facilities to operate, maintain, and train the equipment must also be in place when the set is delivered to the unit. The Army, therefore, has a plan that packages together these required items and identifies windows for fielding them by unit sets.

***Software Blocking*** (SWB) is an acquisition policy and disciplined process through which the Army achieves and sustains an integrated systems-of-systems (SoS) warfighting capability. SWB is a critical enabler of Unit Set Fielding.

Software Blocking as an acquisition process improvement is consistent with Clinger-Cohen and DoD 5000. The framework embodied in the SWB policy harmonizes and synchronizes system software developments and upgrades. It is designed to focus the acquisition process on a disciplined approach for achieving interoperability, commonality, and synergistic functionality. In conjunction with USF, SWB is a conduit for executing Army Transformation.

Under SWB, the Army is making a commitment to divest itself of its traditional systems-centric approach to embrace a SoS capability that supports each element of DTLOMS. This will allow the Army to make smart decisions based on the impact to warfighting capability vice systems. Under the policy, systems include new/upgraded core battlefield systems, trainers, stimulators, test & instrumentation, and simulators needed to achieve an integrated capability across all elements of DTLOMS. Software blocking applies to all Army systems except those business systems that do not exchange information with tactical C4ISR systems and weapons systems.

SWB represents a necessary evolution along the path of acquisition reform. SWB lowers the artificial barrier between elements within the acquisition process that inhibit our ability to develop, test, train, and sustain a synergistic warfighting capability. Through SWB the acquisition process focuses on a total warfighting capability rather than individual systems.

SWB is an Objective Force process that is being implemented to enhance Legacy and Interim Force operational capability. What this means is that it will take a few iterations before SWB is fully matured. Thus, SWB provides the paradigm through which Legacy systems will transition from their stovepipe implementations in support of Joint Venture 2020 objectives.

Joint Venture 2020 requires the insertion of innovations in information technology. SWB provides the vehicle for tuning the

Army's acquisition efforts towards developing the interdependent application necessary to achieve the SoS warfighting capability essential to Dominant Maneuver, Precision Engagement, Focused Logistics, and Full Dimensional Protection. SWB ensures that the critical C4ISR, weapons systems, and SoS network infrastructure is matured in a manner that enhances overall operational warfighting capability while at the same time maximizing the operational effectiveness of individual systems. In a resourced constrained environment, priorities are targeted at maximizing total capability. For SWB, this will require a sustainment of resources from requirements through fielding.

## Army Modeling and Simulation

To obtain the Objective Force as rapidly as possible, the Army will maximize use of the Simulation and Modeling for Acquisition, Requirements and Training (SMART) Initiative. SMART capitalizes on modeling and simulation (M&S) tools and technologies to address system development, operational readiness, and life-cycle cost and is accomplished through the collaborative efforts of the requirements, training and operations, and acquisition communities.

SMART is a framework to provide a disciplined, collaborative environment to reduce costs and time required to provide solutions to Army needs. Key components are the ability to exchange data, algorithms, software, and other information. SMART yields four significant benefits that are of paramount importance to Army Transformation:

1. Reduced total ownership costs and sustainment burden for fielded systems throughout their service life;

2. Reduced time to explore concepts and develop and field new or upgraded systems;

3. Increased military worth of fielded systems while simultaneously optimizing force structure, doctrine, tactics, techniques, and procedures; and

4. Concurrent fielding of systems with their training devices.

In the near term, the Army will invest in training the Army workforce to implement the SMART Initiative as soon as possible. Training will include distributed learning as well as on-site training. The benefit to the Army workforce is clear and unambiguous guidance to ensure maximum collaboration in using models and simulations, a better understanding of requirements, and reduced time to structure contracts using digital data descriptions and virtual prototypes that will shorten procurement lead times and reduce cost of system procurement. All this leads to the acquisition of better weapons systems at a fraction of the time.

The Army will use the SMART Initiative to understand current and emerging operational environments and to better understand required capabilities. Emerging and future concepts will employ technologies, unit constructs, tactics, and procedures unlike those of today's Army. Because these concepts and system designs are not fully mature, the Army must obtain modeling and simulation

tools to develop and analyze these concepts so developers and engineers can refine concepts and designs at a much faster pace, with more iterations, instead of having to build prototypes, experiment in the real world, redesign, build more prototypes, etc. Having all stakeholders involved in this process that uses modeling and simulation in a collaborative environment increases the efficiency and effectiveness of the analyses.

The Army will focus M&S investment efforts on capabilities to represent present and proposed technology, equipment, concepts, and doctrine of friendly, neutral and threat elements in the following subject areas:

- C4I and Information Fusion
- Fighting in Complex and Urban Terrain
- Homeland Security (HLS)
- Weapons of Mass Destruction (WMD)
- Small Scale Contingencies (SSC)
- Information Operations (IO)
- Modeling the Military Decision Making Process (MDMP)
- Space Operations

The Army will invest in upgrades to cost models that will be used to predict accurate life cycle costs. The new models will be based on the latest commercial product equivalents and will be used to estimate costs for emerging and state of the art technologies. These efforts will produce a standard system of on-demand, near-real-time cost estimating capabilities for the Army acquisition community. These models, using the broadest range of acquisition tools, will allow rapid cost as an independent variable analyses and design trade-offs early in the design of a system and thus allow for reduction in the total ownership cost. Linking the new cost model to engineering models will enable cost estimators to use an iterative process to see in real time how changes in design affect the system life cycle cost.

The Army will invest in Simulation to C4I Interoperability (SIMCI) to improve interoperability (horizontally and vertically) between model and simulation and C4I systems while reducing the cost and burden associated with the production and maintenance of traditional interfaces. Development and distribution of SIMCI solutions for design and utilization of common components for the Army Battle Command System (ABCS) is essential for Army Transformation. In a similar vein, the Army is in the process of developing a roadmap that will lead to better representation of space capabilities in Army models and simulations, enabling the utility of those capabilities to be assessed in a proper operational context.

The extensive use of simulations, simulators, and simulation-based C4I systems will be required to meet the Army Transformation requirements. Future systems, including FCS, will also depend on simulations and simulators to develop doctrine, conduct training, develop and analyze courses of action, and conduct combat mission planning and rehearsal. The digital, three-dimensional picture of the battlefield provided by simulations and C4I systems will be possible, however, only if the system is built on an accurate digital environmental database.

Army investment in the Environmental Database Integrated Product Team (EDB IPT) will result in the implementation of environmental database development standards. Implementation of these standards will reduce the cost and increase the reuse of environmental databases to support a wide variety of war fighter applications.

The goal of the Army's investments in modeling and simulation is to reduce risk and identify, support, and transition M&S leap-ahead and high payoff opportunities. The return to the Army for immediate investments in these activities will be realized well before the Army fields the Objective Force.

## Studies and Analysis

As the Army transforms to an Objective Force, it is faced with numerous challenges. Selection of equipment and organizational design requires decisions that chose among competing alternatives and requires a selection process that is aided and informed by rigorous analysis. The Army's analytical efforts over the next several years will focus on building and maintaining multifunctional, combat-capable units. Proper analysis will allow the Army to design organizations that are full spectrum capable in the joint warfight and are capable of achieving decisive victory at minimal risk to Soldiers and their equipment. Army analytical efforts will provide significant assistance in the materiel development and selection process by balancing risk between schedule, performance, and affordability. These analytical efforts will also identify any specific modernization and recapitalization initiatives required to sustain Legacy Force superiority with acceptable risk while the Army focuses resources on enabling the Objective Force.

Today, the sunk costs associated with developing systems are greater than ever. The Army has invested heavily in robust and modernized materiel development and force development infrastructure and has, at any given time, tens of billions of dollars invested in its modernization plan. As we further delay decisions that cancel system development, two forces come to bear on the decision-making process: awareness of the tremendous investment to date (sunk cost), and the further delay in fulfilling the original requirement. Both of these forces work to make smart decisions more difficult and tend to further delay (and increase costs associated with) termination.

Protecting these substantial Army investments requires the Army obtain more information earlier and with greater fidelity. Robust analyses and studies support better decision-making and improve our understanding of requirements, expand technology trade space, and enhance system integration within a system of systems framework.

Army Transformation is a tremendously complex and expensive undertaking. In order to ensure against the costly cancellation and termination of programs, and ensure we balance dollars, technology, and warfighting needs, the Army requires a robust analysis capability that supports the development of a balanced and effective modernization program for the Legacy, Interim, and Objective Forces.

Below is a sample of some of the analyses the Army conducts in support of its modernization program: Warfighting Alternative Analysis Requirements & Resources (WA2R2), Continuous Early Validation (CEaVa), and Value Added Analysis (VAA).

Warfighting Alternative Analysis Requirements and Resources (WA2R2). The Army requires analysis to review warfighting requirements for the Army during Transformation with a view towards the potential impacts on required capabilities and resource reallocation to support Transformation initiatives. WA2R2 provides an updated assessment of the Army's warfighting requirements, integrated capabilities and value-added in the future. The analysis provides insights and an analytical underpinning for building systems and munitions requirements into future programmatic reviews and defending Army requirements.

Continuous Early Validation (CEaVA). Continuous Early Validation (CEaVa) is a decision support system that will aid decision makers and analysts in evaluating acquisition programs. CEaVa will stabilize the problem statement by validating key performance parameters or critical requirements relative to the ever-changing environment. CEaVa makes it clear that the user and developer are solving the right problem. Additionally, it increases the likelihood of producing the correct system.

Value Added Analysis (VAA). VAA provides decision makers an analytical approach for the evaluation and prioritization of competing alternatives to support the development of a balanced and effective Army RDA program. The study purpose is to identify and analyze marginal costs and benefits of weapon systems and develop feasible, affordable modernization investment strategies in support of the Army program planning. The objectives are to produce investment strategies for major weapon systems that maximize force effectiveness subject to constraints on budget, force structure, and production capabilities and to develop a quick reaction analysis tool to address modernization questions during program execution.

## Investment Strategy--Purpose and Priorities

The ultimate purpose and goal of Army modernization is to build and maintain multifunctional, combat-capable units using a Unit Set Fielding approach. The nature of the planning, programming, and budgeting system requires that combat unit components be managed as single entities. It is the whole unit, however, that remains the primary focus. The objective is to achieve an operational capability that satisfies mission needs. The challenge inherent in building combat-capable units through the application of integrated components and the necessary associated functions is the achievement of synergism and complementary results in the units.

In the Army's investment program for PB03, the overriding requirement is to maintain current warfighting readiness. This imperative is the foundation of the Army's commitment to the Nation, and it is likewise the essential enabler for being able to transform to a future force that is better able to meet future strategic requirements.

Second to the imperative of maintaining readiness, the Army in PB03 seeks to maintain and improve the well-being of its people. This is not a luxury, but rather is vital to the Army's overarching capabilities and ability to conduct all assigned missions.

Next, as part of its PB03 program, the Army seeks to accelerate Army Transformation and move towards the future force that is the ultimate objective in the Army's Vision. It is within the context of this effort that the Army's Modernization Strategy of Balanced Modernization guides investment decisions and relative priorities. With the greatest emphasis on the achievement of the future Objective Force and fulfilling more immediate shortfalls with the Interim Force, coupled with the indispensable imperative of current readiness, the Army has chosen to continue taking risk in the modernization of its Legacy Force and the associated mid-term warfighting readiness. This risk takes the form of more selective modernization and recapitalization efforts for the Legacy Force, though still retaining sufficient efforts to ensure essential readiness requirements**.** (*Figure 18)*

Another area of priority for the Army in PB03 relates to programs supporting anti-terrorism and force protection. Increased requirements following the September attacks have necessitated program adjustments, though for many of these the Army will seek additional assistance in order to fully support the additional requirements.

## Objective Force

The Objective Force is the Army's ultimate Transformation goal. It is a future force that achieves the characteristics described in the Army Vision. The Objective Force will be a more strategically responsive Army capable of dominating at every point on the spectrum of operations and will be capable of rapid transition across mission requirements


**Figure 18. Investment Strategy**

without loss of momentum. The Objective Force will be equipped with significantly advanced systems centered on the FCS, the Comanche helicopter, and the Objective Warrior systems. It will be commander-and-execution centric—networked internally and externally through a mobile, adaptive, reliable, command and control capability (implemented by the fielding of key enabling systems such as the Warfighter Information Network-Tactical (WIN-T)). It will leverage joint and interagency reach-back and direct downlink capabilities for intelligence, force planning, administration, technical engineering, information operations and logistical support. (*Figure 19*)

## S&T Efforts

Army S&T is responding boldly to the challenges of the Army Vision. The S&T program consists of a dynamic portfolio of technology investments that is responsive to warfighter needs today and in to the future. S&T seeks technological solutions that can be *demonstrated* in the near term, explores the *feasibility* of new concepts for the mid term, and seeks the *imaginable* for an uncertain far-term future.

FCS is the main thrust of the S&T program, and represents over one-third of all S&T programs. The balance of S&T is targeted to pursuing technologies that support the Objective Force as a whole. These technologies are described below:

- Future Combat Systems—The marquee S&T initiative enabling the Objective Forces is the FCS program. The FCS will be an ensemble of fighting capabilities that meet the weight and volume constraints necessary for C-130 type transport, consisting of land combat platforms tailored to address the ground combat


**Figure 19. Objective Force**

and mobility requirements reflected in the Army Vision. Representative enabling technologies include robotics–unmanned ground and air vehicles– enhanced mobility with electric drives, pulsed power generation, hybrid propulsion, fuel cells, low-power demand electronics and efficient power management.

- Objective Force Warrior (OFW)—The premiere Soldier S&T program will employ open system architectures and high-risk/high payoff technologies to yield an ultra-lightweight, stealthy combat suit; integrated, network-centric communications/sensor/power suite to permit dismounted Soldiers to net and mass fires and generally access the power of the Objective Force; integrated, lightweight sensor/weapons capability with advanced accuracy and lethality in complex terrains and urban environments. The goal is to achieve leap-ahead advances in the areas of survivability, Soldier lethality, and agility to operate for extended periods under arduous conditions, with minimal loss in physical capabilities from fatigue, stress, and hardship. OFW will be an intrinsic, basic dismounted asset within the Future Combat System of Systems architecture and fit within the overall concept of the Objective Force.

- C4ISR—Research and technology to enable comprehensive situational awareness for the Objective Force. This includes advanced sensors and sensor processing, intelligence and electronic warfare systems and techniques, militarized and special-purpose electronics, countermine technologies and C4 system technologies. Keys to this are on-the-move distributed command and control, multifunction sensors and sensor fusion algorithms, and development of a seamless tactical Internet within and between units.

- Basic Research—Investments in the exploration of fundamental phenomena that have significant potential to enhance future land warfare capabilities in areas such as armor materials by design, nanoscience, biometrics, compact power, smart structures, miniature and multifunctional sensors and Soldier performance.

- Medical—Research and technology to protect and treat warfighters to ensure worldwide deployability, increase warfighter availability, and reduce casualties and loss of life.

- Lethality—Technologies to enhance the light forces, such as the Line-of-Sight Antitank (LOSAT) System and the Precision Guided Mortar Munitions; and technologies to provide lethality options for the Objective Force, such as the electromagnetic gun and tactical high-energy laser.

- Rotorcraft—Research and technology to enhance the performance and effectiveness of future rotorcraft, including rotors and structures, propulsion and drive systems, avionics and weapons, and human-systems integration (e.g., crew station) technologies.

- Future Warrior—Technologies to support the future infantry Soldier, including enhanced ballistic protection, clothing and equipment,

dismounted warrior C4, compact power and power management, sustenance and nutritional enhancements, Soldier weapons, and warrior technology integration.

- Logistics Reduction—Technologies to enhance deployability and reduce logistics demand, especially the demand on strategic lift. Examples include precision roll-on/roll-off air delivery, technologies for airfields and pavements to support force projection, 21st Century truck, and robotics to support resupply and reduce demand for food, fuel, and water.
- Personnel Technologies—Advanced training tools and methods to enhance warfighter and commander abilities and performance, advanced human engineering concepts to avoid information overload and optimize task allocation to enhance warfighting effectiveness.
- Survivability—Technologies that enable organizations, platforms, and Soldiers to avoid detection, acquisition, hit, penetration, and kill. Examples include lightweight armor, vehicle-mounted mine detection, and signature management.
- Information Assurance—Technologies and investments that ensure the confidentiality, integrity, and availability of the systems and the data that they share.
- Advanced Simulation—Simulation tools to provide increasingly realistic environments and systems support acquisition, requirements, and training. This includes technologies for networked simulations, embedded training, constructive simulations, virtual environments, and range systems for live use.

## S&T Priorities

The near-term priority is on maturing and demonstrating critical technologies for the Objective Force, with major emphasis on FCS. These technologies will provide the foundation for accelerated acquisition programs to meet the timetable of the Army vision. Key areas of investment include lethality, survivability, C4ISR, Soldier system-of-systems, semiautonomous air and ground robotic vehicles, human engineering, reduced logistical burden, Soldier training and medicine. Advanced technology development (6.3) provides mature technologies for rapid insertion into Army acquisition programs, whether they are new systems or product improvements.

The mid-term focus is on developing and demonstrating block upgrades for the FCS and new capabilities for the Objective Force. Investments that will provide transition products in the mid term are currently being made in applied research (6.2) programs, in areas such as lethality, survivability, C2 on-the-move, advanced simulation, personnel technologies, and logistics demand reduction; this research includes the development of components, models, and new concepts through in-house and industry efforts.

In the far term, revolutionary new warfighting concepts will be enabled by current Army investments in basic research (6.1). The products of current investments in areas such as nanoscience, new cryptographic algorithms, biometrics, smart structures,

and materials-by-design will enable significant enhancements that maintain technological overmatch in our land combat forces.

## Future Combat Systems—Establishing the Requirements

In late October 2001, TRADOC completed work on the Mission Needs Statement (MNS) and Statement of Required Capabilities (SORC) for the FCS. These documents, along with the Units of Action and Units of Employment Operations and Organization concept papers, will form the foundation upon which future development of the Objective Force capability is based.

The requirement for a FCS is driven by the evolving operating environment and capabilities-based threats, combined with the need for a full spectrum dominant force as described in the Defense Planning Guidance, *Joint Vision 2020*, and the Army Vision. Clearly, the Army must be capable of effective response against both modernized conventional and unconventional forces employed in asymmetric strategies and tactics. The FCS mission need has application throughout the range of conflict from peacekeeping missions to major theater war. *(Figure 20)*

Army FCS will enable the Objective Force Units of Action to dominate ground combat across the full spectrum of operations and significantly enhance their ability to conduct decisive tactical maneuver. The FCS directly contributes to the combat battalion's ability to close with and destroy enemy forces, seize terrain, protect territories and civilian populations from hostile forces, and enforce the terms of sanctioned agreements for stability and support operations. The FCS will provide ground forces with a dominant fighting System of Systems with assured overmatch for conducting standoff attack and close combat assault against any threat and in any terrain. It will be highly deployable and sustainable to meet requirements articulated in the Objective Force and Unit of Action Operation and Organization (O&O) documents.

## Request for Proposal–FCS

On 2 November 2001, the Draft Solicitation for the FCS was posted on the Defense Advanced Research Projects Agency (DARPA) web page to facilitate review by industry. The final solicitation was issued on 21 November 2001. The Defense Advanced Research Projects Agency (DARPA) and the Army have issued an "Other Transactions for Prototype" draft solicitation for the Concept and Technology Development (CTD) and the Systems Development and Demonstration (SDD) Phases of the Future Combat Systems Program. DARPA intends to award one agreement for the CTD phase in the late February 2002 timeframe to a Lead Systems Integrator.

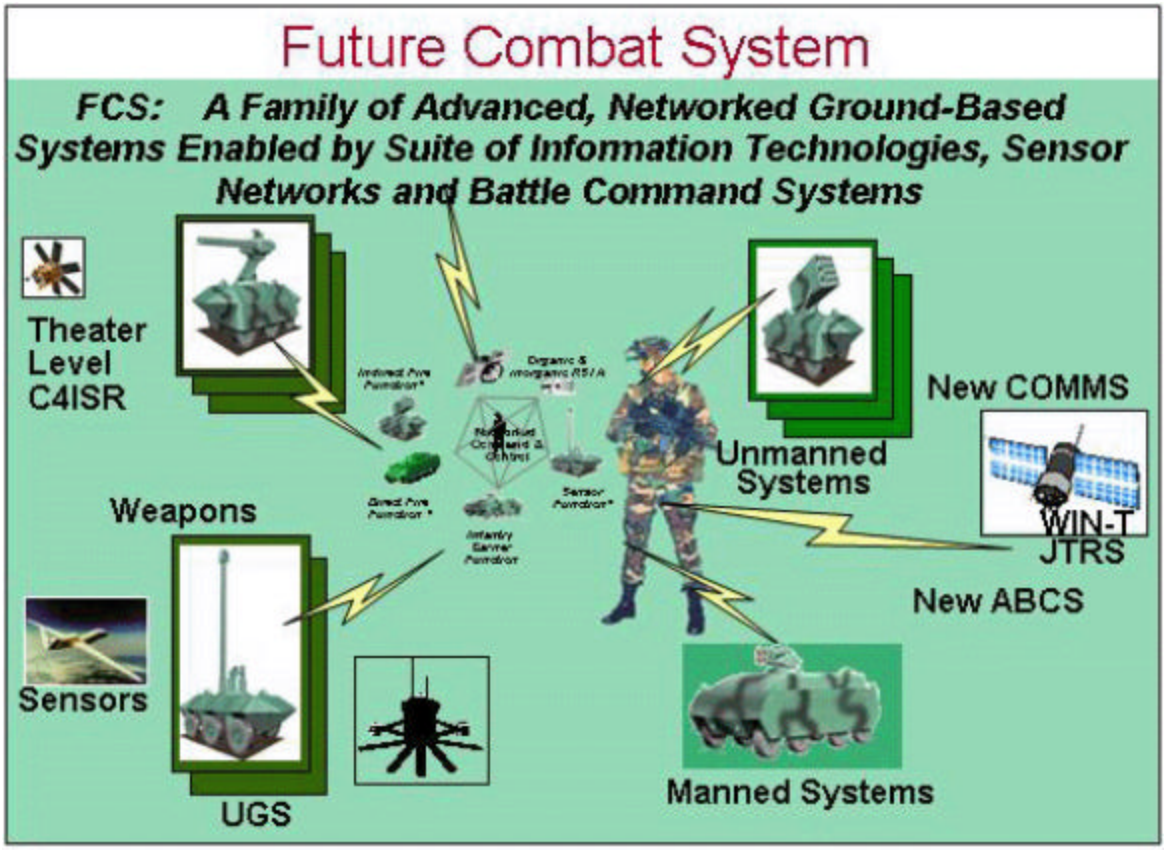


**Figure 20. FCS**

## PB03 Implementation

To support the Army Vision and accelerate the pace of Transformation to the Objective Force, the Army is funding almost $7.9 billion of S&T in the FY03-07 planning period, with over 95% of this targeted for the Objective Force. This amounts to a $167 million increase S&T funding from the PB02 funding levels. This will adequately fund all of the Army's critical S&T requirements to begin fielding the first Objective Force units by the end of the decade. In addition to its own S&T funding, the Army has entered into a joint venture with DARPA, in which DARPA provides an additional $431 million of S&T funding from FY00-05 to develop key FCS technologies. Approximately 40% of the S&T investment is for FCS. The first major milestone on the path to fielding the Objective Force capabilities is the FCS Milestone B decision targeted for 2003. The Army leadership will review the status of technologies currently under development for the FCS and determine their maturity to enter SDD. In addition, S&T efforts will continue to feed block improvement to the initial Objective Force capabilities that the Army will field this decade. The Army will also continue to leverage industry and universities in order to maximize its return on S&T investment dollars.

The Army has made a large down payment towards the FCS SDD phase by funding an additional $3.2 billion of its known requirements. During the FY03-07 planning period, the Army has

accelerated its acquisition strategy for the FCS and now intends to use a lead system integrator to prepare for a Milestone B decision in FY03, production in FY06, first unit equipped (FUE) in FY08, and initial operational capability (IOC) in FY10. As a result of this change and to ensure we achieve IOC by FY10, the Army expects its FCS requirements to increase. In order to ensure continued acceleration of its Transformation momentum, the Army will be seeking additional resources from DoD and Congress.

Comanche is the Army's armed reconnaissance helicopter and light attack weapon system of the future. It is a lethal, survivable, agile, versatile, affordable, responsive, deployable, and sustainable aircraft that is the centerpiece of the Army's Aviation Modernization Plan and the first Objective Force platform to be fielded. The Army has fully funded Comanche in the FY03-07 Plan based on a production rate of 62 aircraft per year. Additionally, the Army has added funding in FY07 in order to begin increasing to a planned production rate of 96 aircraft per year in FY10.

The Army is committed to providing the individual Soldier with the best equipment to meet the challenges of the new operational environment. The Army strategy is highlighted by the Land Warrior (LW), a first generation integrated fighting system for the individual Soldier that bridges to the Objective Force Warrior (OFW). Current funding procures and fields LW for the Ranger Regiment and the six IBCTs by FY08. The Science and Technology OFW program will provide the next generation of capabilities beyond LW with the goal of fully integrating the Soldier with FCS and the Objective Force. OFW development and fielding will be concurrent with FCS.

The Army has fully funded the Crusader program. Given previous force structure reductions and projected future requirements, the Army considers the Crusader program as crucial to its future readiness. Crusader ensures the Army can achieve tactical agility and dominate overmatching fires. Only Crusader can meet the demands of rapidly moving offensive operations. It allows for decentralized employment of our fire support assets and responsive close supporting fires fully integrated with supported maneuver forces. The termination or reduction of this program cannot be accomplished without inducing an unacceptable level of risk to both its mid- and far-term warfighting ability.

## Interim Force

The Interim Force will fill a strategic and operational capability gap, while simultaneously complementing the Legacy Force, by providing the CINCs with a rapidly deployable, tactically superior force capable to meet future operational requirements. Two combat brigades are presently in the process of converting to IBCTs, culminating with the fielding of the IAV. Four additional IBCTs have also been announced and are programmed for fielding.

## Interim Armored Vehicle

Planned procurement is for 2,131 vehicles consisting of two variants: Infantry Carrier Vehicle (ICV) and Mobile Gun System (MGS). The program is

adequately funded for six IBCTs, or one a year from FY 2002 to FY 2007. Once initial milestones are achieved, the IAV can be processed to Milestone C and get approved for Full Rate Production of the remaining three brigades. Next milestone to successfully achieve is completing the Initial Operational Test and Evaluation. This is another evaluation looking at how the IAV operates within the Interim Brigade Combat Team (IBCT). Finally, the last major milestone is May 2003, when the first IBCT will reach Initial Operational Capability (IOC). IOC will be achieved after the 1st IBCT successfully completes a deployment and certification exercise at the Joint Readiness Training Center. (*Figure 21*)


**Figure 21. IAV**

## PB03 Implementation

The Army has allocated over $6.4 billion through FY07 to field six IBCTs. The FY03-07 Plan fully funds the Interim Armored Vehicles, provides an additional $912 million in funding for the support equipment associated with the six IBCTs, funds an additional $106 million for ammunition for the IBCTs, and provides $400 million for IBCT Military Construction (MILCON). These units are being fielded in complete brigade sets to include the MILCON associated with the fielding of this equipment.

## Legacy Force

It is the current Legacy Force that guarantees the Army's near-term warfighting readiness. Since the Army skipped a procurement generation (1990s and 2000s), the age of many of the current force's combat systems often exceed their expected service life (29 years for most Army systems). Today 75% of the Army's major combat platforms exceed their expected system half-life. In order to maintain operational readiness and to stabilize the growth in operating and support costs of the Army's aging weapon systems, the Army has begun to recapitalize and selectively modernize its current force.

## Equipping Initiatives

### Recapitalization

Recapitalization is the rebuilding and upgrading of existing weapon systems and/or tactical vehicles. The goal is to ensure operational readiness, a near zero-time/zero-mile condition for selected priority systems, and stabilize the growth in operating and support costs. The measure of success is in managing fleet age at or below one-half its expected service life. When operationally necessary and financially prudent, the Army will selectively upgrade systems to maintain combat overmatch capability and a technological advantage. Recapitalization efforts will focus on improving the reliability, maintainability, safety, and efficiency of the Army's

current systems at a lower cost than procuring new systems

The Army's requirement to recapitalize all of its systems is significant, and the requirement is clearly unaffordable given the current fiscal constraints and planning guidance. The Army, therefore, has decided to focus its resources on only those systems and units that are absolutely essential to maintaining today's warfighting readiness while taking risk with other systems and other parts of the force. In order to develop an affordable and executable recapitalization program, the Army has prioritized seventeen of its systems that must be recapitalized to a near zero-time/zero-hour standard. The Army's "Prioritized Recapitalization Program", in addition to selecting only 17 systems, also primarily focuses its resources on the Counterattack Corps, taking risk in the Army's remaining units.

The Army has reduced its recapitalization requirements by over $2.4 billion from PB02 and increased its funding by approximately $3.7 billion for those 17 systems that belong to specific units. As a direct result, 100% of the Army's "Prioritized Recapitalization Program" is funded compared to 70% in PB02 for those same systems. This program, which includes the Army's major combat systems (the AH-64 Apache, the UH-60 Blackhawk, the CH-47 Chinook, the M1 Abrams, the Patriot air defense system, and the M2 Bradley) is fully funded.

(*Figure 22*) While the recapitalization program approval process has helped the Army focus its resources, reduce requirements, and develop cost effective, funded programs, the Army must still remain aware of the inherent risk in this program. Even for these 17 systems, the Army still has significant unfunded requirements for systems that reside in other units beside the Counterattack Corps. The majority of the remaining systems will exceed an average half-life by FY10 and a large proportion of those systems will not be upgraded or rebuilt. As a result of its recapitalization strategy, the Army has provided critical combat capability to the Counterattack Corps, accepted risk in its remaining units, and established a process that will help free up resources for the Interim and Objective Forces. The Army will continue to review the scope of its recapitalization efforts each quarter and make adjustments as appropriate.

**Modernization**

The Army focused the modernization of its Legacy Force by identifying and prioritizing those systems that have applicability to the Objective Force. These systems can be classified into two categories: those that are part of the Legacy Force and will transition to the Objective Force (e.g., the Family of Medium Tactical Vehicles (FMTV) and Javelin) and those that are being built specifically for the Objective Force, but can be used by the Legacy Force (e.g., the Tactical Unmanned Aerial Vehicle (TUAV) and High Mobility Artillery Rocket System (HIMARS)). By doing this, the Army is ensuring that its resources are efficiently spent on systems that will benefit it both now and in the future.

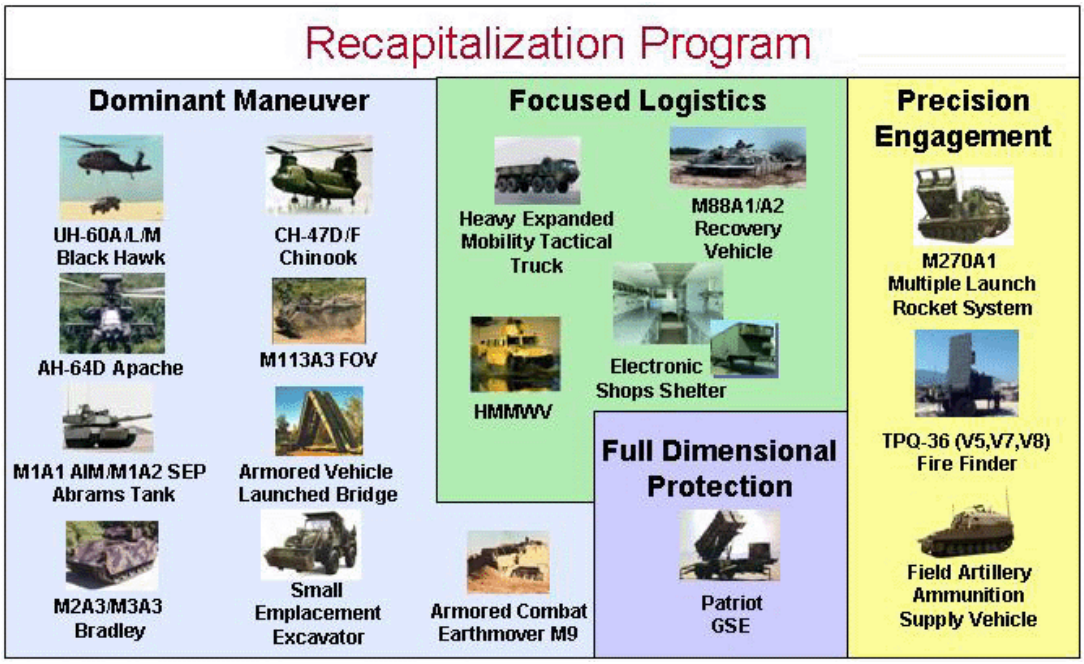


**Figure 22. Recapitalization**

In an effort to accelerate the Transformation to the Objective Force, the Army accepted risk by focusing modernization efforts on selected units and capabilities. Only the Counterattack Corps, some XVIII Airborne Corps units, the Interim Force, and a limited number of other units will receive system upgrades and enhanced capabilities. In order to protect critical Objective Force development and Interim Force capabilities during FY03-05, it was necessary to terminate or restructure legacy systems during the FY03-07 planning period. The Army continues to take risk in its Legacy Force in order to accelerate its Transformation efforts.

In 1988, the Army had seven different helicopters. When the Comanche is fully fielded, the Army will have only three (Comanche, Black Hawk, and Chinook). This will result in a large savings in both training and logistics. By eliminating Vietnam-era aircraft from the force, AH-1 Cobras this year and UH-1 Hueys by FY04, the Army has freed resources to support the recapitalization of AH-64 Apache, UH-60 Black Hawk, and CH-47 Chinook aircraft. This will reduce the number of aircraft in the Army inventory by 1,131 aircraft (from 4,533 in FY01 to 3,402 in FY07), a reduction of 25%.

## PB03 Implementation

The Army continues to take risk in its Legacy Force recapitalization and modernization programs. Over the past two planning periods, the Army has terminated or restructured 18 different programs that resulted in $9 billion in savings being reinvested in Army Transformation. The FY03-07 Plan continues this trend. Although the Army has added over $4.1 billion for legacy type equipment over the planning period (all in FY06 and 07), the Army continues to scrutinize its investments in the Legacy Force. Funding was sustained for high priority systems that will transition to the

Objective Force, increased for associated support equipment that will be fielded to the Interim Force, and reduced for systems that are not essential to Transformation. The result of this review was that the Army terminated 18 additional programs and reduced 12 others for a total reallocation of $5.8 billion. Additional fiscal constraints and DoD guidance resulted in a further decrease of over $450 million of funding for Legacy Force systems.

As a result of the terminations and restructurings, the Army investment profile has undergone a paradigm shift over the past three planning periods. Only about 16% of the Army's modernization funding is devoted to systems that will be used solely by the Legacy Force, with over 50% of total funding being devoted to procuring systems that can be used by the Legacy Force and also transition to the Objective Force or be used directly by the Interim Force. As the Army looks for savings in future years, there are very few remaining legacy-only systems remaining whose reductions would not seriously impair the readiness of the current force, which remains the guarantor of near-term warfighting readiness.

# Summary and Conclusions

As a result of the horrific attacks in September 2001, the United States is now at war in what may prove to be a long-term struggle. The Army, likewise, is preparing itself for battle as an integral part of this campaign against terrorism. Army Transformation, which was initiated in October 1999 in anticipation of future missions in a changed strategic environment, has now taken on an even greater urgency in light of this immediate challenge. As a result, the Army is making every effort to accelerate the ongoing Transformation process in order to field these new capabilities as soon as possible. The goal of Transformation is to ensure that the world's preeminent land force maintains and improves its ability and demonstrated will to fight and win our Nation's war decisively—now and in the future. To achieve this goal and maintain its strategic relevance to the Nation, the Army is focused on fielding units that are capable of fighting and winning against any potential adversary in a rapidly changing, unpredictable, and asymmetrical battlefield.

The *Army Modernization Plan* outlines the intent and strategy of building these future combat units that will have the agility and versatility to succeed against any opponent. It also provides the overarching strategy of maintaining the current force to ensure that it maintains the essential readiness to defeat any threat while the Army is transforming itself. As a bridge to the future Objective Force, the Interim Force will increasingly ensure that the Army can respond rapidly to any contingency with increased responsiveness and deployability. The *Army Modernization Plan* identifies the requirements and current plans for fielding these important new capabilities.

The *Army Modernization Plan* focuses modernization efforts through the three

paths or vectors of Transformation, and it describes the overall modernization strategy as well as the key processes that will facilitate the building of combat-capable units. While the materiel aspects of modernizing and transforming the Army are a central theme of the *Army Modernization Plan*, it is essential that modernization be fully coordinated, balanced, and synchronized across the critical requirements of doctrine, training, leader development, organizations, and Soldiers. Respective annexes are devoted to a specific discussion of these essential areas. Above all else, and just as is true today, people remain central to the success of the transforming Army.

The Army has accomplished much since the Army Vision was announced in October 1999, and the Army leadership has taken prudent risks and made hard decisions in order to make Transformation succeed. In addition, the Army continues to balance the requirements for transforming with imperatives to maintain current readiness, fulfill new operational commitments, and support homeland security. The end result for FY03 is a balanced Army program that accepts risk where possible and devotes resources to the highest priorities.

The *Army Modernization Plan* is submitted in conjunction with the release to Congress of PB03, which continues to implement and fund Army Transformation. Specifically, the Army's portion of the PB03 submission provides funding for the following:

- Fully funds procurement of the Interim Armored Vehicles and associated fielding in Unit Sets for six IBCTs; provides additional resources for support equipment, ammunition and Military Construction.
- Funds procurement and fielding of Land Warrior for the Ranger Regiment and six IBCTs by FY08..
- Funds almost $7.9 billion for Science and Technology over the length of the Future Years Defense Plan (FYDP), an increase of $167 million from last year.
- Funds $5.1 billion over the FYDP for the System Development and Demonstration phase of the Future Combat Systems; accelerates acquisition strategy by using a Lead Systems Integrator to ensure fielding the Objective Force in this decade.
- Fully funds the procurement of Crusader and Comanche.
- Accelerates and fully funds the development of the Warfighting Information Network—Tactical, the next generation of tactical and operational communications.
- Fully funds the Army's "Prioritized Recapitalization Program" of 17 systems.

**Shortfalls for support of Transformation**, however, continue to exist in PB03 in the following areas for implementation of Army plans through FY07:

- Does not adequately fund the limited modernization of the Legacy Force.
- Does not sufficiently fund the recapitalization of the remainder of the force that is not a part of the

"Prioritized Recapitalization Program".

The Army has continued to make major changes in its plans and resourcing in support of ongoing and future Transformation. The Army has made difficult decisions during the budget planning process in order to meet the urgent requirements of the current security environment while at the same time assuming appropriate risk to sustain the momentum of Army Transformation. Balancing risk—with the exigencies of readiness, new operational requirements, homeland security and Army Transformation—will remain an overriding imperative for the future.

Thus far the Army has made significant progress on its path to a revolutionary improvement in the capability and responsiveness of the future force. Sustained support and funding will be essential in reaching this goal and simultaneously fulfilling the Army's unalterable commitment to the Nation's security.

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# 2002 Army Modernization Plan

# Annexes

## Introduction

The main body of this *Army Modernization Plan* discusses how the Army plans to transform itself over time into the Objective Force. This plan is focused on implementation of Army Transformation, the purpose of which is to preserve the Army's ability to execute the National Military Strategy and preserve its full spectrum dominance in the changing strategic and operational environment. The evolutionary development of today's Army into light and heavy forces has left a capability gap in the mid-intensity area of the spectrum of operations. This is the area where success requires both responsiveness, achieved by rapid deployment and arriving ready to fight, and a high level of military capability in the form of lethality, tactical mobility, and survivability.

Two of the Transformation paths, Legacy Force and Interim Force, directly address maintaining the Army's combat superiority in fighting and winning our wars decisively and fielding an element that can address a near-term capability gap. Selective modernization and recapitalization of the existing Legacy Force is designed to maintain and improve our war-winning edge over any potential adversary. At the same time, we are fielding a complementary set of units, the IBCTs, that fills the existing capability gap between responsive light and special purpose forces and the dominant lethality and survivability of our heavy forces.

The end state, however, remains the future Objective Force, which will be a multi-role force fully capable of dominating any enemy in any environment. The Objective Force embodies the characteristics required for dominant superiority across the entire spectrum of conflict—responsiveness, deployability, lethality, survivability, agility, versatility, and sustainability. The IBCTs are a part of the solution, but until we can field the Objective Force we must maintain all of the capabilities inherent in our light, interim, and heavy forces.

Once fielded, the Objective Force will provide the Nation's leaders with an Army of units that possess the best characteristics of the heavy and light forces. They will be enabled by a system of systems that inherently contains all of the capabilities found in the various pieces of today's Army, yet requires far less logistical support to function at high efficiency. Objective Force leaders will also provide our nation an invaluable resource. Future full spectrum operations will demand adaptive, self-aware leaders and an increased range of missions and distributed environments will emphasize the decentralization of decision-making. This environment will require enhanced teamwork and leader team building skills and independent, small-unit action will require heightened interpersonal skills especially at junior leader levels. Increased ambiguity and complexity of future operational environments will

demand leaders with fully developed critical thinking skills. Leader development transformation will include the development and validation of interventions that strengthen and accelerate the acquisition of cognitive and interpersonal skills critical for successful leadership in the Objective Force. These tools will support self-development, institutional training, and leader development in units. They will focus on personnel assignments—right place, right time, guided and supported self-development, and simulation environments that include virtual experiences.

This future force, like the Army of today, will be designed and expected to operate as part of a joint team of forces from all Services, as well as most likely a part of a multinational combined operation. *Joint Vision 2020* (*JV 2020)*, published in June 2000, serves as the guiding framework for how the joint forces, including the Army's Objective Force, will operate in the future strategic and operational environment.

## *Joint Vision 2020*: Conceptual Framework for Full Spectrum Dominance

*JV 2020* guides the continuing transformation of America's Armed Forces in the 21st Century. The overall goal of Army Transformation is the creation of a force that is dominant across the full spectrum of military operations—persuasive in peace, decisive in war, preeminent in any form of conflict. *JV 2020* describes the operational concepts necessary to shape our joint forces to meet the Nation's strategic goals.

The overarching focus of *JV 2020* is Full Spectrum Dominance achieved through the interdependent application of Dominant Maneuver, Precision Engagement, Focused Logistics, and Full Dimensional Protection. Attaining that goal requires the steady infusion of new technology, early testing and evaluation that produces a body of knowledge and learning to enable technology, and modernization and replacement of equipment. Materiel superiority alone, however, is not sufficient. Of greater importance is the development of doctrine, organizations, training and leader development, and Soldiers that effectively take advantage of the technology.

The evolution of these elements over the next two decades will be strongly influenced by two factors. First, the continued development and proliferation of information technologies will substantially change the conduct of military operations. These changes in the information environment made information superiority a key enabler of Transformation. Second, U.S. Armed Forces will continue to rely on a capacity for intellectual and technical innovation. The pace of technological change, especially as it fuels change in the strategic environment, will place a premium on our ability to foster innovation in our people and organizations across the full range of joint operations.

*JV 2020* lays out the concept for future joint warfare. It has five central functional imperatives that the joint force and its land power component must be able to

do to execute the future fight. These imperatives, expressed as essential capabilities, are the following:

- Dominant Maneuver—the ability of joint forces to gain positional advantage with decisive speed and overwhelming operational tempo in the achievement of assigned military tasks.
- Full Dimensional Protection—the ability of the joint force to protect its personnel and other assets required to decisively execute assigned tasks.
- Precision Engagement—the ability of joint forces to locate, discern, and track objectives or targets; to select, organize and use the correct systems to engage or attack; and to generate desired effects, assess results, and reengage with decisive speed and overwhelming effect as required throughout the full range of military operations.
- Focused Logistics—provide the joint force the right personnel, equipment, and supplies in the right place, at the right time, and in the right quantity, across the full range of military operations.
- Information Superiority—the attainment of superior information flow that supports mission objectives.

We must continue to invest in and develop new military capabilities where needed to make our Army faster, more lethal, and more precise in 2020 than it is today. The following annexes to the *2002 Army Modernization Plan* outline the Army's major efforts to equip the force to achieve the operational capabilities of Dominant Maneuver, Full Dimensional Protection, Precision Engagement, Focused Logistics, and Information Superiority. These equipping efforts are combined into an overall Materiel Annex that is subdivided along these *JV 2020* imperatives. Army Transformation and modernization, however, is not solely about materiel, and subsequent annexes are devoted to describing the comprehensive nature of Army efforts to synchronize efforts across the breadth of a total solution. Specifically addressed in separate annexes are the critical elements of Doctrine, Training and Leader Development, Installations, Personnel, Force Structure, Space, and Homeland Security. Collectively, these annexes describe the Army efforts needed to make Transformation successful.

## Structure of Annexes

There are eight annexes included with this year's *Army Modernization Plan*. The first one summarizes equipping efforts to support implementation of Army Transformation, and it is organized along a *JV 2020* construct. It describes how the Army's functional areas provide the requisite capabilities to support the respective operational concepts. The next five annexes address key aspects of the total solution to transforming the force—Doctrine, Training and Leader Development, Installations, Personnel, and Force Structure. The final two annexes are devoted to a full spectrum functional area, Space, and to an area of increased urgency today, Homeland Security. Following is a listing of these eight annexes:

**Annex A: Materiel**

**Annex B: Doctrine**

**Annex C: Training and Leader Development**

**Annex D: Installations**

**Annex E: Personnel**

**Annex F: Force Structure**

**Annex G: Space**

**Annex H: Homeland Security**

## Summary

The Army is not about equipment. More than any other Service, the Army's capability is embodied in organizations made up of Soldiers and leaders who employ equipment to accomplish mission-essential tasks. That is why Transformation is about Army leaders, their ability to motivate Soldiers within their units to perform to the best of their abilities, and, finally, about the tools that they need to perform those tasks. The Transformation strategy ensures that adequate organizational capabilities are aligned with the range of tasks the Army must be prepared to perform.

# Annex A: Materiel

# Dominant Maneuver

## General

Dominant Maneuver is the ability of joint forces to gain positional advantage with decisive speed and overwhelming operational tempo to achieve military tasks. Widely dispersed joint air, land, sea, amphibious, special operations, and space forces, capable of scaling and massing force or forces and the effects of fires as required for either combat or noncombat operations, will dominate across the range of military operations through the application of information, deception, engagement, mobility, and countermobility capabilities. Dominant Maneuver requires forces that are adept at conducting sustained and synchronized operations throughout the full spectrum of operations, in all environments, and with joint and combined forces to rapidly achieve objectives from dispersed locations, at reduced risk, and with fewer platforms and a smaller logistics requirement.

Overall, the strategy for modernization of the Maneuver, Mobility, Soldier Systems and the Aviation functional areas aims fundamentally at supporting the Army's Transformation process within the existing resource constraints.

## Ground Combat Maneuver, Mobility and Soldier Systems Modernization in Support of Transformation

### Overview

Maneuver, Mobility forces and Soldier Systems will transform to the Objective Force end state along three major paths—the Legacy Force, the Interim Force, and the Objective Force. The Army will maintain and improve warfighting capabilities of the Legacy Force through modernization by recapitalizing selected fleets through rebuild and selective upgrade programs. The sustainment and improvement of legacy systems will focus on the Counterattack Corps to ensure combat overmatch and mitigate risk as the Army transforms to the Objective Force. Improving survivability, lethality, and maintainability are critical components of the modernization strategy. The Army's Objective Force will continue to be the 21st Century's preeminent land force for the broad range of missions from support, including Homeland Security, to decisive warfighting.

**Light Forces.** Future adversaries will exploit urban and complex terrain for sanctuary. Light forces must be extensively trained, properly equipped, and psychologically prepared for urban warfare. The modernization of light combat maneuver forces (SOF, Ranger, Air Assault, Airborne and light infantry units) will seek to make significant

improvements in lethality, survivability, mobility, C4ISR and sustainability in order to meet the complex demands of full spectrum operations. Critical components of light force modernization focus on equipping the individual fighting soldier through the "Soldier As A System" modernization approach, and equipping light units with systems and platforms enabling combat overmatch against any and all threats, day or night. Enhanced lethality against mechanized forces through the fielding of the Javelin and Line-of-Sight Antitank Weapon (LOSAT) and highly accurate and responsive indirect fires through the deployment of the Mortar Fire Control System (MFCS) will remain essential capabilities for light combat forces.

**Mechanized Forces.** Our modernization and recapitalization efforts for legacy mechanized forces give priority to maintaining near-term warfighting capability of a Counterattack Corps. The focused recapitalization through rebuild and selective upgrade programs targets platforms that are expected to remain in service (Active and Reserve Components) throughout the Army's Transformation to the Objective Force. To retain flexibility and mitigate risk the Army has synchronized three critical decision points. The Objective Force (Future Combat System) technology decision in FY03 will drive the decision concerning the digitization of the Active Component fleets outside the Counter Attack Corps. The FY06 reliability decision concerning Abrams formations will determine if the new tank engine will be inserted in the Active Component Abrams fleet outside the Counter Attack Corps. These established decision points allow the Army to correctly balance resources in support of the Army's Transformation.

**Interim Force**. Combat maneuver and mobility forces initiated Interim Force implementation in FY00 by beginning the conversion of two Fort Lewis-stationed units—a 2nd Infantry Division heavy brigade and a 25th Infantry Division light brigade—to an Interim configuration. Meeting a rapid deployment requirement means the Interim Force has to be equipped with reduced weight and volume combat vehicles. The Interim Armored Vehicle (IAV) was selected by the Army to ensure that the deployability requirements of the Interim Force can be met.

**Objective Force**. Army Transformation leads to the Objective Force. Today, the science and technology (S&T) community is working hard to develop a family of systems which is collectively referred to as the Future Combat Systems (FCS). FCS is envisioned as a digitized, system of systems, land-combat capability with multi-mission functionality. FCS' primary design characteristics include networked command and control (C2) on the move; beyond line-of-sight (BLOS) direct fires; advanced, long-range, precision indirect fires; standoff sensors; countermine capability; and robotics. When technologies are mature, and when the production lines are ready, we will field the FCS in unit sets.

While FCS represents a major S&T and acquisition effort, the enduring hallmark of the Objective Force will be its soldiers. Soldiers and units must be organized, manned, equipped, and trained to do the job decisively.

This means that we must prepare resource and equip them to overcome both the risk of mission failure and the risk of exorbitant casualties. Objective Force soldiers will be physically and psychologically prepared for non-contiguous warfare, fighting in small units separated from their higher headquarters or sister units for days at a time. The Army will provide soldiers the maximum protection at the individual level, whether that soldier is on a platform or on the ground. The soldier and platforms will leverage integration of lighter, more effective ballistic protection (composite materials) with active and passive protection systems to enhance survivability against kinetic energy weapons, and current and projected enemy lethal effects.

**Seamless Transition**. The maintenance of a trained and ready force to ensure operational readiness and technology transfers from the upgraded legacy systems and interim systems to the Objective Force is the focus of the modernization effort. Certain technologies developed first in legacy systems, as part of modernization programs, will ultimately lead to Objective Force platform technology insertions. Force XXI Battle Command, Brigade and Below (FBCB2) integration, power plant improvements, munitions development, digital components and integrated communications systems (voice activation, wireless intercoms), and the family of Standoff Minefield Detection Systems (STAMIDS) provide the materiel transition to the Objective Force. The experiences our soldiers and commanders will have with these emerging technologies will lead to a nearly seamless transformation to the Maneuver, Mobility forces and Soldier Systems of the Objective Force.

**Soldier Modernization.** The soldier in the 21st Century must be capable of performing a myriad of missions across the full spectrum of operations around the world and at home, to include peace enforcement, counterterrorism/ homeland defense, and regional conventional conflict, while maintaining a core competency to provide land power dominance. Although well equipped, today's soldier does not possess combat overmatch in the close fight in complex or MOUT environments, nor is he properly equipped to transition to the objective force and fight and win decisively on the future battlefield.

Soldier Modernization encompasses the integration of soldier systems and equipment that consist of everything that is worn, carried, or consumed for individual use in a tactical environment. The “Soldier as a System” is analogous to any other major weapons systems platform, in that it has numerous component parts that must work in harmony to be effective. Yet, modernizing the soldier is uniquely different from all other major weapons systems platform modernizations in two significant respects. First, the soldier system frame is human; its loss is not measurable in dollars. Second, the soldier is the common element for all Army major weapons system platforms

and the operation of every system is affected by the quality of the soldier and the synergy created by his or her ability to interface effectively and efficiently with his or her equipment and systems.


The soldier modernization strategy provides for integrated soldier systems to enhance the soldier's capabilities in the near-term. Science and technology followed by technology insertion will equip the objective force soldier with the capabilities essential for full spectrum dominance. With the soldier as the critical link to success in the patterns of operation, enhancing soldier combat effectiveness through improvements in warfighting capabilities is imperative to future mission success and transforming the soldier who will remain the heart of the Objective Force.

The soldier modernization process is accomplished through the use of one of three soldier system development paths: the Soldier Enhancement Program (SEP), the Clothing and Individual Equipment (CIE) program, and the Warrior Programs (represented by Land Warrior, Mounted Warrior, and Air Warrior).

The SEP (Marines participate through the Marine Enhancement Program–MEP) requires minimal Research, Development, Test, and Evaluation (RDTE) effort and shortens the developmental phase of the life cycle process through the use of commercial off-the-shelf (COTS) items with a goal of three years to fielding to soldiers.

The CIE program encompasses all combat, life support, ballistic, and environmental protection items worn or carried by the soldiers for individual use (that have not already been addressed under the SEP program.

Central Funding and Fielding (CFF) is the procurement mechanism that acquires and fields life-support and

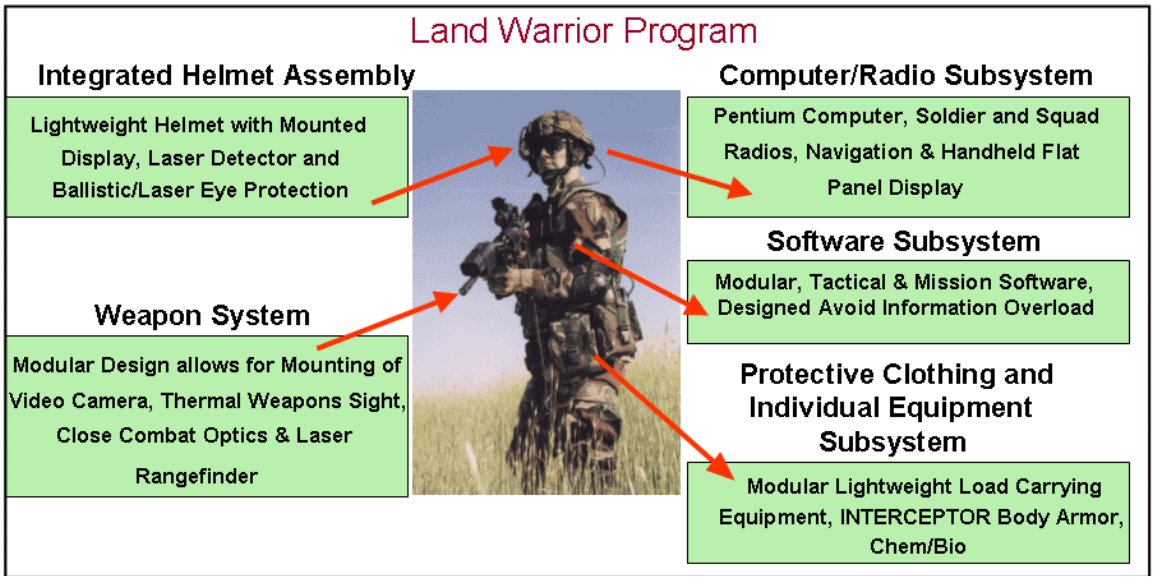
mission-enhancing equipment to individual soldiers. CFF has been the mechanism used to field items developed by the SEP program and the Organizational Clothing and Individual Equipment RDTE (OCIE) process. The intent is to field these items within a three-year period after RDTE is complete.

**Warrior Programs.** Advancement of the flagship Warrior Programs will provide the soldier with a decisive winning edge on the battlefield. Incorporating Commercial-Off-the-Shelf (COTS) and Government-Off-the-Shelf (GOTS) components and high-payoff, advanced technologies, the Warrior Programs will transform combat soldiers into lethal, survivable soldier systems.

Land Warrior (LW) is a first generation modular, integrated fighting system for infantry soldiers that integrates many components and technologies into a lethal, survivable, mobile, and more situationally-aware soldier system. Land Warrior combines sensors, computers, lasers, geo-location, and radios with soldier's mission equipment to achieve the Army Vision of enhancing the individual soldier's lethality, survivability, mobility, and situational awareness. The systems approach optimizes and integrates these capabilities, to include integration with the Army Tactical Internet, without adding to the soldier's combat load or logistical footprint. LW block improvements will include alternative power sources, Combat ID, and system voice control in the near term to meet objective requirements and Objective Force Warrior technologies in the far term.

LW S&T advanced technology components, to include alternative power sources, Combat ID, vector graphics maps, and system voice control, will be technically inserted over time to meet objective requirements.

Air Warrior is an integrated, modular Aviation Life Support Equipment and Chemical/Biological protective ensemble. The AW system is modular in design to permit tailoring for mission requirements, to minimize weight and bulk, and to facilitate maintenance and support.



Mounted Warrior will be a system of systems, linked through technology insertion to other Warrior Programs, which significantly enhances the combat vehicle crewmember's operational capabilities.

## Discussion of Key Equipment

### Soldier Modernization

**Own the Night Modernization.** Advances in un-cooled thermal sensors and Image Intensification and the fusion of both promise to provide our soldiers with the ability to overmatch enemy soldiers. The Enhanced Night Vision Goggle, a passive sensor fused electro-optical night vision device, will provide soldiers with the ability to engage and execute close combat in all levels of light, adverse weather conditions and under battlefield obscurant conditions. Thermal Weapon Sights are a family of low-cost, lightweight, man portable


infrared imaging devices of high resolution to be used for surveillance and fire control of individual and crew served weapons during both daylight and darkness. TWS operate in adverse weather and dirty battlefield scenarios including light foliage, smoke, dust, and camouflage and will be fielded to legacy, interim and objective forces.

**Objective Individual Combat Weapon (OICW).** This dual barrel OICW will combine the lethality of a 20mm air-bursting munitions, 5.56mm NATO ammunition, and a full solution target acquisition/fire control system to affect decisively violent and suppressive target effects and provide a leap ahead in small arms performance. This target acquisition/fire control system will incorporate a laser rangefinder, ballistic computer, direct view optics, video sight, electronic compass, thermal capability and a target tracker. The OICW's high explosive air bursting munitions will be capable of defeating not only exposed targets, but those in defilade (targets that have taken cover behind structures, terrain features and/or vehicles), a capability which the current rifle and carbine do not have.

**Interceptor Body Armor (IBA)** provides "bullet-stopping" protection for dismounted soldiers and Marines against fragmentation, fleschettes, and small arms rounds (7.62x54, 5.56 Green Tip) at a reduced weight compared to current systems.

**The Body Armor Set, Individual, Countermine (BASIC)** provides improved ballistic protection for dismounted soldiers engaged in countermine tasks/missions and by other soldiers operating in an environment where mines are present. The BASIC is an integrated, outerwear clothing system designed to provide ballistic and blast protection against medium to high velocity Anti-Personnel (AP) mines.

**The Advanced Bomb Suit** will provide protection from Unexploded Ordnance

(UXO) and Improvised Explosive Devices (IED) fragmentation, blast, and overpressure. A modular design configuration will meet the specific needs of various users. It reduces weight (roughly 12% using new lightweight materials), improves protection, and combines service requirements.

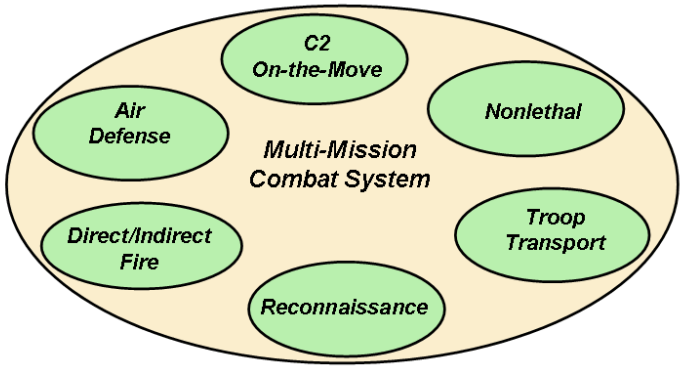
**Operational Requirement.** Modernizing the soldier to maintain combat overmatch will continue to remain a high Army priority. The Soldier System programs above focus on increasing lethality, survivability, C4ISR and sustainability of the individual soldier faced with emerging threats across the spectrum of conflict in different environments. Soldier modernization must remain a very high priority as the Army defeats the threat today and transforms to the Objective Force.

**Program Status.** Emerging operational requirements and urgency have increased the potential for program acceleration of night vision goggles and thermal weapon sights (currently under funded). OICW funding is pending outcome of the pre-Milestone B decision/review in 2QFY02. The IBA (fielded since FY00), BASIC (begins fielding in FY02) and the Advanced Bomb Suit are sufficiently funded to meet critical requirements but are also potential acceleration candidates to meet emerging needs. Land Warrior, although funded for Special Operation Forces and IBCTs, has potential for accelerated fielding with additional procurement funding.

## Ground Forces

### ***Future Combat Systems (FCS)***

**Description**. The FCS is a networked systems of systems that will serve as a core building block within the Objective Force to develop overmatching combat power, sustainability, agility, and versatility necessary for full spectrum military operations. The FCS enables soldiers to operate as a coordinated part of a distributed, networked force, enabling innovative operational behaviors and organizational structures. The FCS will enable soldiers in the Objective Force to perform a wide range of military activities and operations, from small-scale contingencies to stability and support operations to major theaters of war. The FCS operates as part of an overwhelmingly lethal, strategically deployable, self-sustaining, and survivable combat and combat support force.




The FCS leverages advanced technologies with the capability to incorporate future advances via a

deliberate technology insertion program of block improvements over time. Versatility will be realized through emphasis on an open architecture system concept, with an easily upgradeable and tailorable design approach to enable the system of systems to engage in different missions as needed. The program uses key promising technologies and techniques in areas such as survivability, lethal and non-lethal effects, supportability, propulsion, mobility, structures, robotics, human factors, training, and modeling and simulation. Such technologies combined with innovative concepts of operations and an open systems architecture approach support the fielding of FCS-equipped combat formations this decade and into the future.

The FCS provides a secure command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) system to harness advances in the distribution and effective use of information power. The FCS may consist of a combination of manned and unmanned air and ground elements.

**Operational Requirement**. The operational requirements are not finalized. The Army approved the draft Mission Needs Statement (MNS) on 25 October 2001. The MNS identifies a force possessing campaign qualities of endurance, stamina, robustness and sustainability, enabling it to fight for the duration of a campaign supporting strategic, operational, and tactical tasks. To accomplish these qualities, the force must be enabled to: See First, Understand First, Act First, and Finish Decisively.

**Program Status**. In February 2000, the Army partnered with the Defense Advanced Research Projects Agency (DARPA) and established an aggressive, collaborative demonstration program. The Army budgeted funds for the DARPA/Army collaborative program, identified S&T programs that support the FCS initiative, and assigned an Army program manager to DARPA. In September 2001, the Army assigned total program management authority to the Program Executive Officer, Ground Combat Systems. In November 2001, DARPA released a draft solicitation to industry requesting proposals for a Lead Systems Integrator responsible to conclude the Concept and Technology Development phase by providing the systems architecture and material concept to meet required Future Combat Systems capabilities and support feasibility demonstrations up to the Milestone B decision in the third quarter of fiscal year 2003.

## ***Interim Armored Vehicle (IAV)***

Description. The Interim Armored Vehicle (IAV) is the centerpiece combat and combat support platform for the Interim Brigade Combat Teams (IBCTs) of the Interim Force. Two variants of the IAV will be fielded: the Mobile Gun System (MGS) and the Infantry Carrier Vehicle (ICV). There will be eight additional configurations of the ICV: Reconnaissance Vehicle, Mortar Carrier, Commander Vehicle, Fire

Support Vehicle, Engineer Squad Vehicle, Medical Evacuation Vehicle, Antitank Guided Missile Vehicle, and Nuclear, Biological and Chemical Reconnaissance Vehicle. Performance highlights of the IAV include: strategic responsiveness-roll on/roll off combat capable with minimal preparation, decisive offensive action-dismounted infantry assault enabled by fires and platforms, holistic survivability and force protection- integral all around 14.5mm AP and 152mm artillery airburst protection (upgrade to RPG with add-on armor) and superior situational awareness-internetted Combined Arms Company Teams to give a full spectrum capability. The IAV provides a unique family of systems approach that maximizes commonality and integrated capabilities while filling an immediate gap in the current force.

**Operational Requirement**: The IAV fills a requirement for the Army that provides a rapidly deployable and strategically responsive vehicle across the full spectrum of operations: stability and support operations (SASO), small-scale contingencies (SSC) and major theaters of war (MTW).

Early Entry, Offensive Orientation and Combat Brigade; the IAV in IBCTs support the Chief of Staff of the Army's Campaign Plan Initiatives:

- More lethal and survivable than Light Brigades
- More Deployable and Support able than Heavy Brigades

The capabilities the IAV provides to the IBCT enables the Army to respond immediately to urgent operational requirements and lays forth a glide path to the Objective Force.

**Program Status**. Planned procurement is for 2,131 vehicles consisting of two variants: Infantry Carrier Vehicle (ICV) and Mobile Gun System (MGS). The program is adequately funded for six IBCTs, or one a year from Fiscal year 2002 to fiscal year 2008. The Army is aggressively seeking to accelerate the production, fielding and Initial Operational Capability of the IBCTs.

***Abrams Tank***

**Description.** The Abrams rcapitalization program seeks to maintain combat overmatch and reduce operations and support costs. The M1A2 System Enhancement Program (SEP) is a selective upgrade of the M1 tank or the retrofit of the fielded M1A2 tank that includes a rebuild of critical components to near zero hours/miles. M1A2 SEP tank includes the insertion of a 2nd Generation Forward Looking Infrared Radar (FLIR) with a Commander's Independent Thermal Viewer (CITV) to enhance the target acquisition and significantly improve lethality, digital components to support FBCB2, digital diagnostics, thermal management to reduce battlefield signature, and improved armor protection to sustain survivability against

emerging threats. The M1A1 Abrams Integrated Management Program (AIM) is a rebuild program with selective technology insertions designed to extend the service life of the fleet while reducing operations and support costs. The M1A1 D (Digitized) tank is a rebuilt tank appliquéd with FBCB2. The Army will decide in FY03 whether to continue digitization of the rest of the Active Component. Critical to all Abrams platforms is the Abrams Crusader Common Engine (ACCE) program.

While the Counterattack Corps M1A2 SEP tanks will be retrofitted with the ACCE, the Army will decide in FY06 if the remaining Active Component Abrams tanks will get the ACCE.

**Operational Requirement**. The Abrams tank provides mobile, protected, firepower to the joint force commander to close with and destroy enemy ground forces using Survivability–capable of surviving against the full range of battlefield threats, Lethality–capable of destroying any known threat on the modern battlefield, Mobility–key components include speed, acceleration, and maneuverability, and Information Dominance–key components are situational awareness and digital C2. Current fleet age and expected service requirements out to FY2032 mandate a rebuild and selective upgrade program to sustain combat viability and overmatch against emerging threats at acceptable risk.

**Program Status**. The selective upgrade M1A2 SEP is currently being fielded to the Counter Attack Corps and is expected to be complete by FY12. The synchronization of the Bradley and Abrams with Unit Set Fielding remains under funded for 3rd Armored Cavalry Regiment and 3rd Infantry Division. The AIM program is funded to support 790 platforms for the Active Component forces.

## ***Bradley Fighting Vehicle***

**Description**. The M2A3 (rebuild and selective upgrade) fielding (1,037 platforms) to the Counter Attack Corps ensures overmatch by increasing the ability to acquire, identify, and engage over the A2, in both day and night conditions. The A3 Bradley allows the crew to acquire more targets faster by adding the 2nd Generation FLIR with a CITV. The Position/Navigation (POS/NAV) system enhances the crew's navigation capability and their ability to pinpoint and identify friendly and enemy positions. The A3's new integrated FBCB2 digitized C2 system provides for a near-real-time integrated data link between the A3 Bradley and other combat vehicles. The M2A2 ODS-D, a digitized through appliqué M2A2 ODS Bradley, supports the fielding of engineer variants (295 platforms) within the Counter Attack Corps. The M2A2 ODS has limited upgrades to improve lethality, survivability and reliability is expected to be fielded to Active Component forces (1,333 platforms).

**Operational Requirement**. The BFV provides mobile, protected transport of an infantry squad to critical points on the battlefield and performs cavalry scout and other claimant (Bradley-equipped combat engineer, fire support and Stinger teams) missions. Current fleet age and expected service requirements

mandate rebuild and selective upgrades to ensure the Bradley fleet remains reliable and sustains combat overmatch within acceptable risk.

**Program Status**. Between FY98 and FY12, the Army will complete the modification of 1,037 A2 BFVs to the A3 configuration and 295 M2A2 ODS to the M2A2 ODS. Digitization of the rest of the Active Component fleet is subject to an FY03 decision that is linked to the FY03 FCS technology decision and the Abrams decision discussed above.

***M113 Family of Vehicles***

tracked vehicles, with 16 configurations deployed throughout the world. M113 FOV variants include the M113A2/A3 Armored Personnel Carriers (APC), M577A2/A3 Command Post Carriers, M981A2/A3 Fire Support Team Vehicles (FIST), M1064A2/A3 120mm Mortar Carriers, M548A1/A3 Cargo Carriers, M58/M1059/M1059A3 Smoke Generator Carriers, M901A1 Improved Tow Vehicle, M1068A2/A3 Standardized Integrated Command Post System (SICPS), (a key role in digitized divisions) and Opposing Forces Surrogate Vehicle for the National Training Centers. The M113 modernization program provides a highly mobile, survivable, and reliable tracked platform that is able to maintain pace with Abrams and Bradley units. This platform is highly adaptable to a wide range of current and future battlefield missions at a minimal operational and support cost.

**Operational Requirement**. This system supports the legacy transition path of the Army's Transformation Campaign Plan. Operation Desert Storm highlighted the need to modernize the M113 A2 to the A3 configuration to keep pace with tomorrow's battlefield. Furthermore, the M577A3s and M1068A3s support the Interim warfighters' digitized requirements and capabilities, such as FADC2, AFATDS, TOCs, and MCS. This multi-purpose fleet is required for the next 30 years and will continue to be modernized to ensure the Army's transformation is successful.

**Program Status.** Modernization of the M113 FOV enhances its operational capability, extends its service life, and provides the soldier with a more mobile, reliable and survivable system. The Army has funded $60 million for retrofitting the counterattack corps with T-150 track, which significantly extends track live and lowers sustainment cost.

***Missiles***

**Description.** The Army continues to improve the Anti-Tank (AT) lethality and survivability of its light and early entry forces through implementation of several key equipping and force structure initiatives.

**Improved Target Acquisition System (ITAS).** Army light infantry battalions will be rounded out with a Reserve Component (RC) AT company (-) which

will provide an AT capability equivalent to that of airborne and air assault infantry battalions. Specifically, the light infantry battalion's heavy AT capability will be increased from four to twenty TOW systems through an augmentation with four RC platoons during mobilization. With its second generation Forward Looking Infrared (FLIR) and eye-safe laser range finder capabilities, ITAS greatly increases the situational awareness, lethality and survivability of these TOW HMMWV equipped units. ITAS' digital architecture and modular design enables it to insert new technologies such as a moving target indicator and spectral discrimination while simultaneously accommodating the necessary modifications to fire the Common Missile.

**Line of Sight Anti-Tank (LOSAT).** The assignment of five divisional Round-Up AT battalions equipped with LOSAT, will further improve the AT capabilities of our light, airborne and air assault divisions. LOSAT battalions, with their rapid fire, extended range and highly effective kinetic energy (KE) missiles, will complement chemical energy (CE) missiles at the battalion level. This combination of KE and CE missiles will significantly enhance the lethality and survivability of our light forces by exasperating threat countermeasure design and employment. Moreover, LOSAT technology currently has great potential for Objective Force application given the ability of LOSAT KE munitions to defeat all predicted armored vehicles.

**Javelin**. The Javelin missile provides our dismounted infantry a highly formidable medium AT capability for the dismounted close fight. As a fire-and-forget missile with top and direct attack modes and 2.5 times the range, Javelin is a leap-ahead improvement over Dragon. Moreover, the Javelin's Command Launch Unit (CLU) greatly improves battlefield surveillance and survivability.

**Common Missile.** As the primary weapon system for Comanche and a candidate lethality system for Future Combat Systems, Common Missile is an Objective Force system. Additionally, with appliqué kits, Common Missile will be backward compatible to dominant maneuver ground forces equipped with ITAS and the Improved Bradley Acquisition System (IBAS). Able to engage threat armor and ADA targets at extended ranges, Common Missile will maximize the survivability of our ground and air platforms and their crews. A blocked evolutionary acquisition program, the initial Common

Missile to be fielded will meet a minimum set of threshold ground and air missile requirements with a single missile that improves existing capabilities by first fielding Common Missile's core capability, while supporting blocked increases in capability through its modular design. As a single missile for ground and air platforms, Common Missile is critically important to maximizing the Objective Force's operational flexibility and minimizing its logistics requirements.

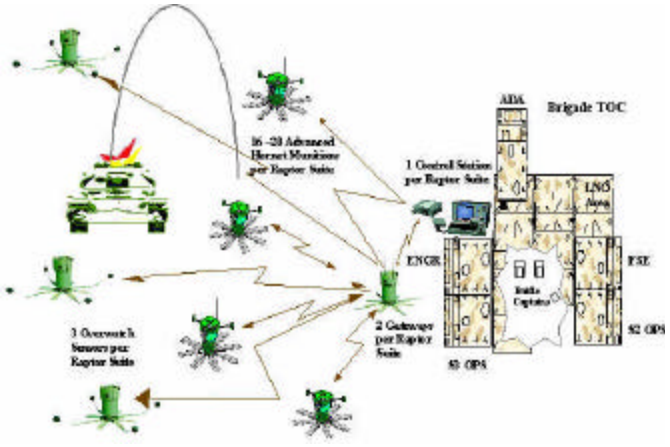
**Operational Requirement.** Our light, interim and heavy infantry forces must have significant lethality against mechanized forces to ensure force protection, combat overmatch and sustainability on the symmetrical and asymmetrical battlefield. Providing extended range fire and forget missiles is critically important to ensuring the survivability of both our ground and air platforms. Legacy Force ground systems, expected to be in service throughout the transformation to the Objective Force, and Objective Force ground and air systems must have lethality against emerging mechanized and ADA threat forces without large logistical requirements.

**Program Status.** For the near term, our current inventory of TOW 2A and TOW 2B missiles will remain the core heavy AT capability of our legacy ground forces until the Common Missile replaces these legacy missiles. Common Missile will also replace the Laser Hellfire, which ended procurement in FY97, and the Longbow Hellfire missile, which ends procurement in FY03. Critically important to the Objective Force, Common Missile also mitigates near term TOW 2A, TOW 2B, Laser Hellfire and Longbow Hellfire inventory risk.

## ***Mobility and Countermobility Systems***

**Description.** Mobility systems play a vital role in the Army's Legacy and Interim Forces by ensuring the Army retains freedom to maneuver in hostile environments. Operation Enduring Freedom has highlighted the importance of systems that provide ground forces with the ability to detect and defeat minefields and other battlefield obstacles. As the Army transitions to the Objective Force, it will look to the S&T community to provide leap ahead capabilities.

## ***Raptor, Intelligent Combat Outpost***



**Description.** Raptor is a tactical or operational obstacle consisting of a Control Station, Advanced Hornet munitions, one or more Gateways (artificial intelligence/data fusion), Overwatch Sensors (OS), and long-haul communications. Block I Raptor obstacles will be hand-emplaced at ranges 35-50 km forward of the maneuver brigade or Unit of Action Tactical Operations Center (TOC), and will detect, classify, and autonomously engage threat heavy and light tracked and heavy wheeled vehicles based upon programmed attack tactics.

**Operational Requirement.** Raptor is a suite of lethal and non-lethal munitions, sensors, communications, and software working in combination to enable the commander to protect his battlespace and influence the actions of his adversaries.

**Program Status.** This system is currently in S&T development.

***Handheld Standoff Mine Detection System (HSTAMIDS)***



**Description.** HSTAMIDS is a handheld mine detector capable of detecting metallic and non-metallic anti-tank (AT) and anti-personnel (AP) mines. This system combines the maturing technology of ground penetrating radar (GPR) and improved metal-detection (MD) to provide a high probability of detection (Pd) for both large and small metallic and non-metallic AT and AP mines. HSTAMIDS will significantly improve detection of the smaller, low-metal AP mines with a probability of detection for all mine types in excess of 95%. HSTAMIDS will reduce the percentage of false detections associated with operating in combat zones, by allowing the operator to "tune-out" the metallic clutter that affects the Army's legacy mine detector, the AN/PSS-12. The infrared (IR) forward-looking detection subsystem component of HSTAMIDS has been deferred to future product improvement effort. The overall design weight of the HSTAMIDS will be comparable to that of the AN/PSS-12 for both detector head weight and control equipment.

**Operational Requirement.** HSTAMIDS is a handheld mine detector capable of detecting metallic and non-metallic Anti-Tank (AT) and Anti-Personnel (AP) Mines. HSTAMIDS will be a significant improvement over the current capability for detection of the smaller low-metal mines.

**Program Status.** HSTAMIDS successfully completed Program Definition and Risk Reduction (PDRR) and entered Engineering & Manufacturing Development (EMD) in November 2000. HSTAMIDS will begin Operational Testing (OT) in FY03, and production in FY04. This program was identified as a potential acceleration candidate to meet emerging and urgent needs.

***Ground Standoff Minefield Detection System (GSTAMIDS)***

**Description.** GSTAMIDS Block 0 clears a 20 Km route in 12 hours using a tele-operated detection vehicle, Mine

Protected Clearance Vehicle (MPCV), and a towing vehicle with proofing trailers. GSTAMIDS Block 1 clears a 40 Km route in 6 hours. The detection vehicle utilizes a multi-sensor mine detection suite consisting of Metal Detection, Ground Penetrating Radar (GPR), Quadrupole resonance (QR), and Infrared (IR) to locate all anti-tank mine types. The MPCV provides soldiers a blast-protected vehicle from which to remotely operate the lead detection vehicle and mine detection sub-systems. The MPCV supports mine confirmation and neutralization sub-systems. GSTAMIDS Block 0 is a contingency-based item; a total of 10 systems will be fielded to contingency stocks from FY03-04. GSTAMIDS Block 1 will be fielded to Corps Engineer Battalions (12 systems per Corps Engineer Battalion) in FY 05-16.

**Operational Requirement.** The mission of GSTAMIDS Block 0 and Block 1 is to conduct route clearance operations, detecting all Anti-Tank mines. GSTAMIDS Block 2 will provide a forward-looking capability for mine detection and avoidance. GSTAMIDS is a spiral development effort to provide an incremental, near-term capability to execute on-road countermine missions.

**Program Status.** GSTAMIDS Block 0 is in year two of a three year EMD Phase. GSTAMIDS Block 0 begins Government testing in Sep 01. GSTAMIDS Block 0 begins production in FY02. GSTAMIDS Block 1 begins production in FY05. This program was identified as a potential acceleration candidate to meet emerging and urgent needs.

### Ground Combat Maneuver, Mobility and Soldier System Summary

The Army cannot devote the resources necessary to meet all requirements and has had to make difficult choices based on capabilities needed, emerging threats and the operational environment. Legacy Force readiness to meet the non-negotiable contract with America to fight and win the Nation's wars must be adequately resourced without delaying or slowing the Transformation process. The procurement and fielding of the Interim Force (IBCTs) is fully funded and on track. Objective Force development is the main effort of Transformation, and the Army is confident it will meet the challenges it has set for itself and field an Objective Force capability by the end of this decade.

## Aviation Modernization in Support of Transformation

### Overview

Aviation is an essential contributor to *Joint Vision 2020* Operational and Enabling Concepts of Dominant Maneuver, Full Dimensional Protection, Precision Engagement, Focused Logistics, and Information Superiority. Operating as a part of the Joint/Combined Arms Team, aviation is

a key combat enabler capable of shaping the battlefield, developing situational awareness, providing long range fires, shielding the maneuver force, and extending the tactical and operational reach of maneuver commanders for the interim and objective force. Aviation supports the Army's requirement to establish and maintain an unrelenting OPTEMPO. Aviation is relevant to the Army's stability and support requirements, to include Home Land Defense (HLD) requirements. Aviation modernization and sustainment insure these capabilities are maintained. These include:

- Fielding the RAH-66 Comanche
- Recapitalizing the AH-64 Apache, UH-60 Black Hawk, CH-47 Chinook
- Modernizing the Fixed Wing fleet
- Joint/combined force digitization/connectivity
- Aircraft Survivability Equipment (ASE) upgrades
- HELLFIRE modernization and developing a lower cost, lighter weight version and an Advanced Precision Kill Weapon System (APKWS) to augment HELLFIRE
- Improving soldier survivability/stamina through Air Warrior
- Replacing obsolete air traffic services and aviation ground support equipment
- Developing the technologies to insure UAV interoperability and Next Generation/Future System development
- Leveraging technology to reduce costs and improve training.

## Legacy Force Aviation Modernization

Selected aviation Legacy Force modernization is essential to current operations as well as support to interim and objective forces. Key legacy force initiatives are divesting older aircraft and recapitalizing existing aircraft projected to remain in the fleet into the far-term.

Under current projections, the AH-64 will remain in the fleet until sufficient RAH-66 have been procured to replace them in the FY2020 timeframe. Current funding provides for remanufacture of 501 of 741 AH-64As to the AH-64D configuration. Recapitalization will extend aircraft life by incorporating 2$^{nd}$ Generation FLIR and addressing high maintenance demand/O&S cost drivers. The OH-58D Kiowa Warrior will remain in the fleet under current transition plans until at least FY2013. Kiowa Warrior modernization is limited to safety enhancements and software upgrades to maintain compatibility with the ground force. Just over 950 UH-60As averaging over 18 years old are in critical need of recapitalization. The UH-60M/HH-60M recapitalization program is scheduled to begin production in FY04 to bring these aircraft up to UH-60L lift/range capabilities, incorporate more modern and interoperable avionics, and extend aircraft life. The CH-47 modernization program includes a fleet wide engine upgrade program and recapitalization of 243 CH-47Ds to the CH-47F configuration. These efforts restore lift capabilities, incorporate digital avionics, and extend aircraft life by approximately

20 years. The Army is currently reviewing its fixed wing requirements for the Objective Force. In the interim it is modernizing its aging, turboprop C-12 and RC-12 fleet with Global Air Traffic Management system (GATM) as well as other safety and cockpit management systems. Older C-12's are being replaced with the UC-35B, which has already been identified as an Interim to Objective Force system. A review of all Army fixed wing requirements is underway. Essential to the support, sustainment, and modernization of the aircraft programs discussed above are aviation's supporting capability programs (Aircraft Survivability Equipment (ASE), avionics, Aircrew Integrated Systems (ACIS), Air Traffic Services/Air Traffic Control (ATS/ATC), Aviation Ground Support Equipment (AGSE), Training Aids, and Devices, Simulators, and Simulations (TADSS)). Aviation TADSS must leverage technology to provide effective and affordable combined arms/joint training and mission rehearsal and to insure simulators remain current with the aircraft/systems they are replicating.

## The Interim Aviation Force

The urgent need to address the steadily deteriorating condition of the aviation fleet and accelerate reserve component modernization coupled with fiscal realities have forced a deferral in converting aviation units to the multi-function battalion structure documented in the *2001 Army Modernization Plan*. The planned conversion has been superseded by a more affordable and timely restructure plan. This interim aviation force is the bridge to an objective aviation structure. The interim transformation plan:

- Postures aviation for transition to the objective force concept
- Accelerates divestiture of approximately 1,000 legacy aircraft (AH-1s NLT FY02 and UH-1s NLT FY04)
- Accelerates modernization across the Active and Reserve Components (transformation to interim structure complete FY04 timeframe)
- Restructures and standardizes attack and lift formations across the force (divisional attack battalions to 18 aircraft, Corps attack battalions to 21 aircraft, Cargo companies to 14 aircraft, reduces number of utility companies)
- Adjusts stationing and alignment of RC units to mitigate near-term risk associated with reducing Active Component lift assets
- Maximizes training technologies to maintain crew proficiency
- Invests in initiatives to improve aircraft reliability/maintainability
- Continues Emphasis on fielding Comanche

This interim structure provides capabilities necessary to meet Army requirements across the spectrum of operations until transition to an objective force structure becomes feasible. Implementation of Flight School XXI remains an unprogrammed priority (additional TH-67 procurement required). Flight School XXI will improve aviator proficiency and allow retirement of legacy OH-58C training aircraft. The Army will continue to refine aviation objective force structure requirements

with the expectation that it can be implemented in a timeframe more in line with the Army's objective force implementation plan and RAH-66 fielding.

## Objective Force Aviation Modernization

The primary role of Objective Force aviation is to dominate with precision fires, provide accurate and timely reconnaissance and Command and Control (C2), provide force protection, and enhance close combat operations through air assault, aerial resupply, and force repositioning. Aviation is envisioned to consist of modular units capable of rapid deployment with early entry forces and split based operations once deployed in theater. Key objective force enablers are the RAH-66 Comanche and key enabling technologies in electronics, UAV interoperability, air platforms, propulsion systems, and weaponization required for insertion in current systems or incorporation into next generation/future system (i.e., Future Utility Rotorcraft, Air Maneuver & Transport, Modernized HELLFIRE replacement, Advanced Precision Kill Weapon System (APKWS) and future Unmanned Aerial Vehicles (UAVs)).

The Army will continue to examine the best means to achieve the vertical envelopment capability required to rapidly project Future Combat System equipped forces across difficult or distant geographic locations. An Air Maneuver & Transport (also referred to as Future Transport Rotorcraft) represents one solution should an organic Army system be required. Regardless, the CH-47F is expected to remain the Army's heavy lift helicopter until at least the 2020-25 timeframe.

To support full spectrum logistics aviation must be as responsive and capable as the force it supports. To improve responsiveness, reduce vulnerability, and increase operational momentum, aviation must reduce the current in-theater aviation logistics footprint. This will require modernization of logistics systems and review of manpower requirements.

## Discussion of Key Equipment

***RAH-66 Comanche***

**Description**. The RAH-66 Comanche is the Army's objective reconnaissance and attack helicopter. No other current or programmed helicopter can meet this requirement. Comanche is designed to meet objective force mission requirements for reconnaissance and attack worldwide, day or night and under adverse weather conditions. It is a 2-pilot, twin engine (T-801) aircraft with an all-composite, low observable fuselage and second generation targeting and pilotage sensors. Supportability features include embedded diagnostics, minimal special tools, reduced support equipment, and fewer parts, which contribute to a reduced logistical

footprint. Comanche is self-deployable as well as transportable.

**Operational Requirement.** Comanche supports the objective force commander as a survivable, multi-role reconnaissance/attack platform. Comanche's ability to develop and share the "common operating picture" and orchestrate lethal, non-lethal, precision, direct and indirect fires is critical to the integration and synchronization of air-ground team operations of the objective force. By interfacing with Army and Joint $C^4I$ systems and teaming with UAVs, Comanche will further extend the operational reach of the maneuver force. Comanche's will be assigned to reconnaissance, attack, cavalry, and special operations units.

**Program Status.** (Subject to Change Based Upon Comanche Restructure Decisions) Comanche is in engineering and manufacturing development (EMD). Department of Defense approval to enter the EMD stage was granted on 4 April 2000. Thirteen production representative aircraft will be built through FY 2005. This provides fully equipped aircraft to support the flight test development program and evaluate the system in the field environment prior to initiation of LRIP and accelerates Fire Control Radar development. The RAH-66 acquisition objective is 1213 aircraft.

## ***AH-64 Apache***

**Description.** The AH-64 Apache is the Army's heavy division/Corps attack helicopter. The AH-64D remanufacture effort incorporates a millimeter wave Fire Control Radar (FCR), Radar Frequency Interferometer (RFI), fire and forget radar guided HELLFIRE missile, and cockpit management and digitization enhancements. The combination of the FCR, RFI, and the advanced navigation and avionics suite of the aircraft provide increased situational awareness, lethality and survivability. Both A and D models are programmed for recapitalization to address Task Force Hawk/Kosovo lessons learned ($2^{nd}$ Gen FLIR, non line-of-sight communications, video transmission/reception, etc.) and reduce maintenance cost drivers. Change 1 to the Modernized Apache Attack Helicopter ORD, dated 21 December 1993, Paragraph 4.b.1(f), states the desire that one model engine be applied fleet wide and performance of a non-Longbow equipped aircraft should equal or exceed that of Longbow equipped aircraft. This initiative of pure fleeting with 701C engines will be examined under the recapitalization of the AH-64D Longbow.

**Operational Requirement.** Apache provides the maneuver commander a highly mobile and lethal aerial weapons platform with an array of armaments to destroy armor, personnel and materiel targets day or night and under obscured battlefield and/or adverse weather conditions. Apache is assigned to attack battalions and cavalry units.

**Program Status.** The Army will convert a total of 501 A models to the Longbow configuration. Multi-Year I delivers 232 AH-64Ds by FY02. A second multi-year contract for an additional 269 AH-64Ds is also programmed with deliveries through FY 2007. Fielding of the 2nd Generation FLIR to the total fleet begins in FY04.

## ***UH-60 Black Hawk***

**Description.** The UH-60 is the Army's objective utility and Medical Evacuation (MEDEVAC) helicopter. The UH-60 fleet is composed of approximately 960 UH-60As, which began production in 1977, and 570 UH-60Ls, which began production in 1989. Black Hawk can transport 11 fully equipped combat troops and external loads up to 8,000 lbs for the UH-60A and 9,000 lbs for the UH-60L. The Army has funded the procurement of the additional UH-60s needed to reach its procurement objective of 1680 by FY12. The UH-60M/HH-60M (MEDEVAC variant) program will recapitalize and upgrade aging UH-60s. This program inserts digital technologies, addresses operating and support cost drivers, incorporates Global Air Traffic Management (GATM) requirements, integrates Air Warrior, and extends aircraft life. The Black Hawk Modernization ORD calls for Block II objective requirements. Improvements needed to reach Block II parameters will be incorporated later in the UH-60 recapitalization program. Analysis of the Army's Objective Force may require development of a new utility aircraft, currently referred to as the Future Utility Rotorcraft (FUR). Another significant modification is the Army Airborne C2 System (A2C2S). This mission kit will convert selected UH-60s into an airborne tactical operations center, allowing C2 on the move and supporting the commander's situational awareness and common view of the battlefield requirements.

**Operational Requirement.** The UH-60 provides the force commander rapid and agile maneuver through air assault, general support, airborne C2, and MEDEVAC. It gives commanders the ability to initiate, conduct, and sustain combat operations by providing internal and/or external lift of troops, weapon systems, supplies, and equipment. In the airborne C2 role, it provides full joint and combined interoperability with other C4ISR elements to commanders at all echelons. The UH-60 is vital to the HLD needs of our nation. The UH-60 is heavily utilized in disaster relief operations, medical evacuation, fire suppression, search and rescue, and VIP transport.

**Program Status.** The UH-60M/HH-60M program is currently in System Development and Demonstration Phase. Milestone C is scheduled for the 2nd quarter FY04 with First Unit Equipped scheduled for FY06. A2C2S begins full-rate production in FY03.

## ***CH-47 Chinook***

**Description.** The CH-47 Chinook is a twin-turbine, tandem-rotor, heavy-lift transport helicopter with a useful load of up to 25,000 pounds. The CH-47 modernization program will provide commanders a more reliable, less costly to operate aircraft compatible with Army digital connectivity requirements. Key modifications integrate an upgraded T55-GA-714A engine to restore performance capability, digital avionics, Air Warrior, emerging Global Air Traffic Management (GATM) requirements, enhanced air transportability, and an Extended Range Fuel System II (ERFS II) for self-deployment missions. It will also incorporate reliability and maintainability improvements to include airframe tuning for vibration reduction, corrosion protection, digital source collector, and recapitalization of 113 components. Currently there are 431 D models in the inventory. The current program recapitalizes 300 of these aircraft and 36 special operations aviation MH-47s. The decision on recapitalizing the remainder of the CH-47D fleet is dependent on funding and timelines for fielding the Air Maneuver and Transport.

**Operational Requirement.** As the Army's only heavy lift helicopter, the mission of the CH-47 is to transport troops, supplies, weapons, and other cargo in general support operations. The CH-47 is vital to the HLD needs of our nation. Secondary missions include medical evacuation, aircraft recovery, parachute drops, disaster relief, and search and rescue. Aircraft are fielded to heavy helicopter companies and Special Operations Aviation.

**Program Status**. The CH-47F completed a Milestone 0/II decision and is currently in the Engineering and Manufacturing Development phase with 2 aircraft conducting developmental and operational testing. Low rate initial production (LRIP) is programmed for FY03 with FUE projected for February 2006.

## ***Fixed Wing***

**Description**. The Army fixed wing program is composed of approximately 300 aircraft categorized by a variety of missions (special electronics mission aircraft (SEMA), operational support airlift (OSA) and other mission support aircraft (OMSA). The aircraft are broken down into specific types, which are short range (C-12), medium range (UC-35), long range (C-37, C-20), cargo (C-23) and SEMA (RC-12, RC-7). Fixed Wing aircraft provide efficient, effective transportation during peacetime and wartime operations. SEMA aircraft collect, analyze, and disseminate signal communications and imagery intelligence in support of wartime requirements for CINCs, field commanders and National Intelligence Assets.

**Operational Requirement.** Fixed-wing aircraft provide the force commander

with rapid movement of personnel, logistics as well as intelligence support. Additionally, the long-range aircraft provide Army leadership with dedicated VIP support while also providing the ability for command and control. Fixed-wing aircraft are heavily utilized in disaster relief operations, air movement, (personnel, supplies), peace enforcement missions, nations assistance, civil support, counterdrug, WMD/NMD, PSYOPS material delivery, security assistance, VIP transport and Homeland Defense.

**Program Status**. The UC-35 (medium range) is currently in procurement with 26 on hand with an AOA of 67. There is currently one more UC-35 programmed within the FY02-07 Plan for procurement. The Aerial Common Sensor is currently being developed as the replacement for the SEMA aircraft (RC-12 and RC-7). This aircraft is programmed to start fielding in FY09 (60 aircraft). The major initiative for fixed wing is the development of TRADOC approved Doctrine and Force Structure that will determine the Army Fixed Wing requirements for the Objective Force. These TRADOC documents will be completed in FY02 and determine the replacement for the aging C-12 (short range aircraft) and C-23 (cargo aircraft). These aircraft will need replacing starting in FY09.

## Aviation Rockets and Missiles

### ***HELLFIRE (HF) Missile***

**Description**. The HELLFIRE (HF) air-to-ground missile is employed to destroy high value point targets. Semi-active laser (SAL) HF tracks laser energy delivered by ground or airborne designators while Longbow HF uses internal millimeter wave radar frequency (RF) for autonomous guidance. The requirements for HELLFIRE modernization are currently being addressed by the Common Missile Development Program. The next generation of HELLFIRE is expected to provide significantly increased range, lethality and resistance to threat countermeasures. It is expected to combine the precision point target capability of the SAL HF and the adverse weather fire-and-forget capability provided by the Longbow HF into one missile with a multi-mode seeker. The Advanced Precision Kill Weapon System (APKWS) incorporates laser guidance into the 2.75”-70 rocket to provide a lower cost, lighter weight, precision weapon capable of engaging non-armored to lightly armored targets and providing an alternative to Hellfire against targets such as buildings,

Command Posts, ADA sites and other targets not requiring the heavier Hellfire.

**Operational Requirement.** AH-64 Apache, OH-58D Kiowa Warrior and RAH-66 Comanche utilize HF as their primary anti-armor munitions. The complementary precision point target engagement capability of the SAL and the fire-and-forget, adverse weather capability of the RF HF provide the battlefield commander with flexibility across a wide range of mission scenarios, permitting fast and decisive battlefield response. APKWS will significantly improve aircraft stowed kill capability in scenarios requiring engagement against non-armored or lightly armored targets.

**Program Status.** SAL HF missiles are no longer in production. Longbow HF entered production in 1995 and completes production of 12,905 missiles in FY03. Modernized HELLFIRE requirements are being integrated into the Common Missile program with FUE scheduled for 2010 or beyond. APKWS is scheduled to begin production in FY05 as a replacement for the current un-guided Hydra Rockets. The APKWS program includes improvements to all warheads.

## Supporting Program Modernization

Aviation's supporting programs are essential to the support, sustainment, and modernization of the aircraft programs discussed above. These programs are essential to sustain and protect crews/aircraft, maintain interoperability with supported units, and field objective force capabilities.

**Aircraft Survivability Equipment (ASE)**. The FY 03-07 Army Plan zeroed all ASE procurement with the exception of FY02 funding targeted to Special Operations Aircraft. However, ASE modernization remains one of aviation's highest priorities, supported by lessons learned from Kosovo and other ongoing operations. Upgrade of legacy ASE had been previously deferred due to planned replacements by the Suite of Integrated RF Countermeasures (SIRFC) and the Suite of Integrated IR Countermeasures (SIIRCM). A revised strategy is being formulated which insures full capability for high priority aircraft and a reduced capability for the remainder of the fleet.

**Aviation Electronics (Avionics).** Avionics programs are designed to insure aviation meets combined arms and joint requirements for C2, mission planning, communications, navigation (to include worldwide civil airspace), information interchange, and interoperability. Major avionics initiatives include fielding a modern airborne C2 system for the UH-60 and a digital TOC for aviation units, ensuring FBCB2 interoperability requirements are achieved, and meeting GATM requirements for civil airspace utilization.

**Aircrew Integrated Systems (ACIS).** The ACIS program develops and fields equipment required to protect, sustain, and enhance aircrew performance in sustained operations, on the ground, and during survival-evasion operations. Air Warrior is the primary ACIS program. It begins fielding in FY04 providing

integrated, modular life support equipment and chemical/biological protection, reduced weight/bulk, and significantly improved flight time in MOPP 4 gear.

**Air Traffic Services/Air Traffic Control (ATS/ATC).** ATS/ATC supports modernization of Army land component commanders' automated airspace C2 requirements, ATC for aircraft operating in terminal and rear areas, and fixed base Army airfield National Airspace System (NAS)/Federal Aviation Administration (FAA) requirements.

**Aviation Ground Support Equipment (AGSE).** AGSE modernization focuses on improved automation and efficiency in three areas of development: modernization of Test, Measurement, and Diagnostics Equipment (TMDE); integration of seamless logistics management through automation systems such as the GCSS –A, and replacement of aging ground support equipment. These contribute to reduced logistical support requirements.

**Aircraft Component Improvement Program (ACIP).** ACIP sustains engineering efforts to investigate, correct, and qualify turbine engine and Auxiliary Power Unit (APU) field-identified, safety-critical and reliability deficiencies. Inserts emerging technology, extends service life, drives down Operating Maintenance (O&M) and spares costs, improves readiness by keeping engines operational and on-wing. Return on investment is greater than 12:1 based on historical data using standard, approved costing models. Leverages funds from Congressional special interest, USN, USAF and FMS. ACIP supports recapitalization/ Transformation objectives.

**Training Aids, Devices, Simulators, and Simulations (TADSS).** TADSS modernization is critical to the combat effectiveness of our aircrews and maintainers, and reducing operational costs. Simulator concurrency, fidelity, and combined arms tactical and mission rehearsal simulators/simulations that network virtual (and when applicable, constructive and live simulation systems) are major initiatives.

## Aviation Summary

Aviation's modernization strategy is a balanced, risk minimizing approach. Modernization efforts are focused on fixing warfighting deficiencies (particularly those uncovered during recent operations), aligning the aviation force with the Army O&O concept, and fielding aircraft/subsystems required to achieve full spectrum operational capability. Modernization is achieved through force structure changes, training initiatives, and materiel modernization (RAH-66, AH-64D, UH-60M/HH-60M, CH-47F, Air Warrior and other subsystem modernization programs). Aviation is supported by Science and Technology programs

designed to provide the knowledge base required to upgrade existing aircraft and meet the challenges of new aircraft/weapon system development. The Army is committed to divesting legacy, obsolete AH-1, UH-1, and OH-58C aircraft and ensuring balanced modernization across both Active and Reserve Components. The Army is reviewing near-term aviation funding issues (aircraft survivability equipment modernization, digitization) to best align programs to create more executable strategies and to identify acceptable risks to allow tailoring of program requirements. Future challenges lie ahead with emerging GATM requirements for airspace utilization, interoperability requirements (UAVs, Force XXI Battle Command Brigade and Below (FBCB2), Global Combat Service Support- Army (GCSS-A)), HELLFIRE replacement, and conversion to an objective aviation force structure.

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# Full Dimensional Protection

## General

One of the effects of the 11 September 2001 attack on America was the increased awareness of the criticality of Full Dimensional Protection not only as a key operational concept for military operations but also as it pertains to the U.S. Homeland.

**Full Dimensional Protection** is defined in *JV 2020* as the ability of the joint force to protect its personnel and other assets required to decisively execute assigned tasks. Full Dimensional Protection is achieved through the tailored selection and application of multilayered active and passive measures; within the domains of air, land, sea, space and information; across the range of military operations; and with an acceptable level of risk. Army modernization and Transformation includes those key full dimensional protection activities/programs, which provide the tools to commanders as they assess and manage risk.

As our forces operate across the full spectrum of operations, it is crucial that we take all possible measures to protect the force and ensure its survival. **Survivability** also affects the perceptions of our adversaries about their ability to fight and win against U.S. forces. But the survivability of the force must extend beyond combat operations and it must address current and emerging asymmetric threats. As the Army transforms, a key capability of the Objective Force will be to demonstrate to potential adversaries the futility of pursuing asymmetric capabilities. It must ensure U.S. forces retain strategic, operational, and tactical positional advantage over adversaries and can conduct high-tempo, sustainable operations despite the presence, threat, or use of these weapons. Conditions must be established and maintained to ensure the survivability of individuals, units, and supporting infrastructure. Thus, survivability cannot depend on only intrinsic capabilities, but must be a combination of active and passive defensive measures executed by the Objective Force. To meet these challenges, the Army must develop the right capabilities and incorporate new technologies to meet expanding mission requirements and counter emerging threat capabilities (including the asymmetric threat).

The overall goal of Army Transformation is the creation of an Objective Force that can defend the U.S. Homeland and is dominant across the full spectrum of military operations—persuasive in peace, decisive in war, preeminent in any form of conflict. Full Dimensional Protection conserves the force's fighting potential and preserves the capability to deploy, enabling the Army to respond at the decisive time and place. Implementing this fundamental operational concept requires the ability to provide anti-access protection by denying use of airspace, and exerting control over the area of operations to ensure friendly forces maintain freedom of action during deployment, maneuver, and engagement. It also requires capabilities to counter enemy systems used to locate, strike, and destroy friendly forces, key infrastructure

and geopolitical assets (both at home and abroad). Additionally, operational facilities, including civil infrastructure, and forces must be protected from concentrated enemy air, space, ground, and sea attacks; nuclear, biological, and chemical (NBC) weapons; and terrorists.

The Army's Full Dimensional Protection modernization effort is synchronized with *JV 20*, and supports the recommendations of the Defense Planning Guidance and 2001 Quadrennial Defense Report. Our protection capabilities will continue to improve against an expanding threat arsenal, which includes information operations, terrorist attacks and other asymmetric threats (including ballistic missiles, cruise missiles and WMD). The result will be improved freedom of action for friendly forces and better protection at all echelons, both at home and abroad.

This annex focuses on some key elements (Legacy thru Objective) of the Army's Full Dimensional Protection mission area, including Air and Missile Defense (AMD) forces and NBC defense assets. To ensure that the Army is protected throughout the full spectrum of operations, these assets must be responsive, versatile, lethal, deployable and sustainable for the duration of operations.

## Air and Missile Defense

### Overview

Army Air and Missile Defense forces, together with joint, multinational, and interagency forces, will *dominate*, *control*, and *exploit* the third dimension of the joint battlespace to win across the spectrum of operations.

To appreciate the full scope of this mission, a clear understanding of the terms dominate, control, and exploit is essential.

- **Dominate.** Dominate is defined as prevailing or predominating the airspace. The three tasks associated with dominating the airspace are: to execute Army engagements ensuring interdependent joint force air superiority; to extend defensive counterair range both vertically and horizontally; and to conduct proactive offensive operations. Dominating the third dimension of the joint battlespace serves a twofold purpose: to ensure the Force Commander's vertical and horizontal freedom of maneuver and to render the opposing force incapable of effectively interfering with joint and multinational operations. Dominating the airspace provides full dimensional protection for the force.
- **Control.** Control is defined as exercising, regulating, and governing the Army use of airspace in close coordination with the joint airspace control authority. Airspace control has a single task—to provide positive (vice procedural) coordination, integration, synchronization, and regulation of Army use of the airspace. Control has three purposes. The first is to assure discrimination of all airspace objects, ultimately eliminating the risk of fratricide. The second is to improve force protection for air and ground forces, and the third is to increase the overall effectiveness

of the force. Airspace control is a critical enabler for the joint force in that it fully synchronizes use of the third dimension.

- **Exploit.** Exploit is defined as taking full advantage of all capabilities and/or information derived from AMD or third dimensional C4 and intelligence, surveillance, and reconnaissance (ISR) sources. The two tasks associated with exploiting the airspace are to provide situational awareness and understanding to the force and to provide focused early warning to military forces and civilian authorities. The purpose of exploiting information superiority is three fold: to enable opportunities for commanders to set the OPTEMPO, to optimize the execution of Army, joint, and multinational operations, and to deny the enemy an information advantage. Exploiting the airspace enables not only airspace information superiority, but overall information superiority.

## Role in the Army

AMD forces will play critical roles in supporting Army operations. These roles include:

- Enabling and sustaining information superiority by denying the collection of aerial intelligence and protecting friendly C4ISR assets.
- Providing situational awareness and understanding to commanders at all levels, enabling them to effectively plan and execute warfighting operations.
- Protecting military forces, critical assets, geopolitical infrastructure, and civilian populations in theater, regional, and homeland areas against TBMs, cruise missiles, unmanned aerial vehicles, and potentially rockets, artillery, and mortars.
- Supporting offensive operations by providing proactive cross-pillar support.
- Providing positive control of the Army airspace to eliminate fratricide and achieve dynamic use of the airspace.

AMD elements will be employed in the Legacy, Interim and Objective Forces to execute offensive, defensive, stability, and support operations at the tactical through strategic levels of warfare.

The **Legacy Force** must respond when, where, and as needed as the Army executes Transformation. As the Army addresses AMD transformation, existing systems like Patriot, Stinger, Avenger, AMDPCS, FAAD C2, Sentinel, and M6 Linebacker must be improved, selectively recapitalized and sustained until they are phased out to ensure that they remain fully mission-capable and combat-effective in support of the Army's interim and objective forces. Robust recapitalization programs are needed to maintain operational readiness, reduce operating and support costs, and allow adaptation to innovative operational employment concepts.

The capabilities of the **Interim Force** must grow to reflect the characteristics of the Army Vision. To ensure the growth of interim force capabilities, AMD will evolve and improve its systems in a synchronized and integrated way that

exploits current and rapidly emerging technology while resourcing science and technology efforts to obtain leap-ahead capability. Efforts are ongoing to leverage investments in technological advancements such as developing a surface launched advanced medium-range air-to-air missile (SLAMRAAM) and a common THAAD/Patriot launcher. To further address transformation, AMD will simultaneously develop and sustain high-altitude to medium-altitude air defense (HIMAD) and short-range air defense (SHORAD) system-of-system packages in the AMD interim force.

The **Objective Force** will reflect the culmination of ongoing system improvements, new system capabilities, and state-of-the-art technologies. It will be modular, highly mobile, tailorable, and interoperable with Army forces, joint and multinational elements, and Interagency team members. It will be fully capable of proactively protecting these forces across the range of military operations. AMD objective research and development programs and initiatives will be structured to achieve this end. The introduction of THAAD, MEADS, EAADS, and JLENS will significantly improve protection of maneuver forces and other vital assets throughout a theater. MEADS will eventually replace Patriot, and EAADS will replace Stinger-based platforms. JLENS will provide elevated sensor capabilities that will complement joint fixed-wing assets and those of ground-based sensors.

AMD in the Army Objective Force will be substantially more capable and relevant than today's Air Defense Artillery. It will be a full spectrum force with special purpose capabilities and advanced strategic responsiveness, deployability, agility, versatility, lethality, survivability and sustainability to dominate, control, and exploit the joint aerial battlespace. AMD in the Army Objective Force will be a transformed force that will **See First, Understand First, Act First and Finish Decisively**—and empower the Army Objective Force to do likewise.

AMD Sees First to empower the joint, multinational and interagency forces to seize and maintain information superiority. AMD will See First by (1) disseminating fused sensor data to provide tailored situational awareness and focused early warning to at-risk forces; (2) deploying ground and elevated sensors to conduct extended range surveillance, and (3) conducting counter RSTA operations to deny the enemy aerial RSTA options.

AMD Understands First to empower the joint, multinational and interagency forces to aggressively shape the battlespace and set conditions for the fight. AMD will Understand First by (1) integrating into a

netted and distributed architecture to provide tailored situational awareness information for situational understanding; (2) fusing sensor data to create a scalable and filterable SIAP and COP for force-wide understanding of the battlespace; and (3) utilizing the SIAP and positive airspace control to dynamically control the airspace to eliminate fratricide and provide dynamic airspace utilization.

AMD Acts First to proactively protect the joint, multinational, and interagency forces and empower them to take decisive action at the times and places of their choosing. AMD will Act First by (1) providing situational understanding and focused early warning, providing tailored situational awareness and targeting information to supporting offensive operations; (2) conducting extended range surveillance and proactive protection to deny the enemy the ability to influence the operational area from the third dimension; (3) conducting positive airspace control to coordinate and synchronize users of the third dimension; and (4) employing FCSs with AMD capability and/or AMD FCS variants with active protection systems to counter direct and indirect fires.

AMD Finishes Decisively by deterring and destroying aerial threats to empower the leaders of the joint, multinational and interagency forces to win decisively and successfully transition to the next engagement. AMD will Finish Decisively by (1) achieving combat overmatch and destroying aerial threats to protect the force; (2) enabling C4ISR for integrated fire control; and (3) providing continuous tailored situational awareness and understanding for subsequent engagements.

## Discussion of Key Equipment

### ***Patriot***

**Description.** Patriot is a corps and echelon above corps (EAC) AMD system that can simultaneously engage and destroy multiple targets at varying ranges and altitudes. It is the world's only battle-proven TMD system. The upgraded system Patriot Advanced Capability-3 (PAC-3) provides a remote launch capability; increases range, altitude, and firepower; and engages multiple maneuvering and non-maneuvering TBM and cruise missile threats. Additionally, a hit-to-kill missile is an integral part of this upgrade.

**Operational Requirement.** Patriot provides long-range, high-altitude AMD protection of corps and EAC ground forces and critical assets.

**Program Status.** PAC-3 Ground Support Equipment upgrades are in the procurement cycle. Upgrades to include the addition of medium and high-range resolution waveforms, a dual traveling wave tube, and a new exciter to the radar; upgrades to the battalion communications equipment; and the ability to remotely

locate launchers up to 30 kilometers from the radar. These changes will improve search, detection, track, and discrimination by the radar, increase battlespace, and improve communications. The PAC-3 missile is in Low Rate Initial Production. Developmental testing concluded in 1st Quarter FY02, with operational testing beginning in 2nd Quarter FY02. A Full Rate Production decision for the PAC-3 missile is expected during 4th Quarter FY02. Cost reduction initiatives are underway with the contractor to produce cost savings for additional PAC-3 missiles. Patriot also has a major recapitalization program. PAC-3 upgrades to counter projected threats, improve joint interoperability, and increase surveillance and detection capabilities are required. Currently, only 7 of 10 Active Component PATRIOT battalions are funded for upgrades to PAC-3, Configuration 3. Additionally, the PAC-3 missile inventory shortfall continues to be a challenge. The Army's requirement is 2,200 missiles with 1,130 funded.

## Air and Missile Defense Planning and Control System (AMDPCS)

**Description.** AMDPCS is the C2 backbone of Army AMD and ensures the right air and missile defense at the right time and at the right place. AMDPCS fully automates $C^4ISR$, integrates AMD sensors, weapons and $C^3I$, and interfaces with ABCS, GCSS and Joint and Allied $C^4I$. It provides ADA Brigades with a fire control system via the Air Defense System Integrator (ADSI) for monitoring and controlling engagement operations by subordinate battalions. AMDPCS provides a common air and missile defense staff planning and battlespace situational awareness tool via the Air and Missile Defense Workstation (AMDWS), which gives the force airspace situational understanding. AMDWS also provides interoperability with Joint Theater Air and Missile Defense (JTAMD) forces. AMDPCS provides interoperability for Army AMD forces with the standard Army Battle Command Systems (ABCS) BMC4I, providing the air situation input to the Common Operational Picture.

**Operational Requirement**. AMDPCS integrates and automates the performance of command and control operations for Air Defense Artillery (ADA) Brigades, the Army Air and Missile Defense Commands (AAMDC), Corps and Echelons-Above-Corps headquarters, and Joint force command and control elements, such as the Battlefield Coordination Detachment. AMDPCS integrates and automates the performance of engagement/force operations at all echelons of command and provides interoperability with joint, combined, and/or interagency force partners.

**Program Status.** Program is in the procurement cycle with a 4QFY97

approved Operational Requirements Document. Major milestones: FY97 Approved as Acquisition Category III Program; 1QFY01 Delivered to first Initial/Interim Brigade Combat Team (IBCT); 3QFY01 Supported DCX-1; 3QFY01 Awarded contracts for design, integration, and fielding of the 263rd AAMDC; 4QFY01 ADSI Certified for TADIL A, TADIL B, and TADIL J message set implementation. Major Upcoming Activities: 2QFY02 Contract Award for Development of AMDPCS for First Digitized Corps; 3QFY02 2nd Interim Brigade Combat Team (IBCT) delivery; 3QFY02 Deployment of 263d SCARNG AAMDC tactical configuration. The FY 03-07 Plan currently funds (partially) the procurement necessary to upgrade and materiel release the currently fielded five brigade Amps and the 32nd AAMDC AMDPCS. Begins procurement for the 263d AAMDC and 111th AMD Brigade. Continues development of AMDWS software versions 2.0 through 4.0 and ADSI versions 11.0 and 12.0. Additional funding is required to provide modeling, simulation, analysis, and exercise support to III Corps and to upgrade computers and communication equipment. Software, models, and simulations must be developed to support III Corps. The computer and communication upgrades procure and replace obsolete hardware and software and prepare for the migration to future data radio systems.

## ***Surface Launched Advanced Medium-Range Air-to-Air Missile (SLAMRAAM)***

**Description.** SLAMRAAM is a heavy variant HMMWV-based launcher platform consisting of launch rails, launcher electronics and $C^4$ components. This system will be used to store, transport, erect, direct, and launch multiple AIM-120 AMRAAMs. It will provide a 20 times increase in the area coverage as compared to current Stinger based systems. This extension of the battlespace will ensure the Army's dominance and provide proactive protection for Interim Brigade Combat Team (IBCT)/Interim Division (IDIV) operations against current and future threats.

**Operational Requirement.** SLAMRAAM is a C-130 deployable AMD system that provides extended-range AMD against cruise missiles, UAVs, large-caliber rockets, helicopters, and fixed-wing aircraft in support of division and corps maneuver forces in tactical, homeland security, and asymmetrical environments. SLAMRAAM will possess a remote-launch capability and is a key element of the Army's Objective Extended Area Air Defense System (EAADS). ) It will provide the Army's divisions with an AMD capability that will allow for simultaneous protection of maneuver forces, key civil/military infrastructure, population centers, and geo-political assets.

**Program Status**. Definition of science and technology activities and milestones are being developed at this time. SLAMRAAM is awaiting final approval of its operational requirements document and is partially funded through FY07.

***Medium Extended Air Defense System (MEADS)***

**Description**. MEADS is a corps and echelons above corps (EAC) AMD system that is scheduled to replace Patriot starting in FY 2012. It offers significant improvement in tactical mobility and strategic deployability as it requires 50% less airlift than Patriot. MEADS will provide continuous coverage alone or with SHORAD Systems in the corps/division area and will use a netted and distributed architecture and modularly-configurable battle elements, which allows it to interoperate with other airborne and ground-based sensors to provide a robust, 360 degree defense.

Operational Requirement. MEADS is a lower-tier AMD system that provides low to high-altitude air defense, theater ballistic missile defense, and cruise missile defense of the maneuvering force and fixed assets. It will synergistically operate with upper-tier, Corps, and Divisional AMD systems while improving lower-tier strategic responsiveness, deployability, agility and survivability.

**Program Status.** Program is in a risk-reduction effort which is designed to prepare for design and development, focus on technical risk areas, incorporate PAC-3 Missile into the MEADS architecture, achieve international cost and schedule consensus, and define program strategy. The FY03-07 Plan currently funds completion of the risk-reduction effort, including the development of prototype MEADS major end items, and the start of the design and development phase. Additional development and procurement programs will be required to ensure uninterrupted interoperability with Army and other service AMD systems. A phased pre-planned product improvement program will anticipate and maintain continuous overmatch against any emerging threat.

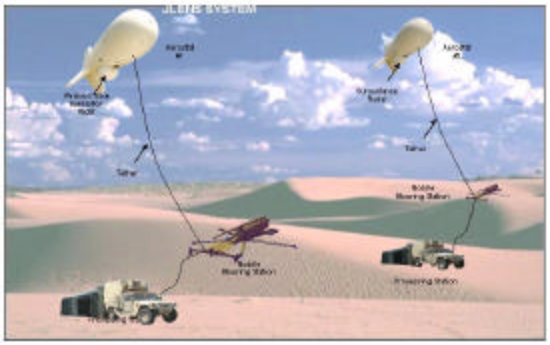
***Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS)***

**Description.** JLENS is a theater-based system using advanced sensor and networking technologies to provide wide-area surveillance and precision tracking of land attack cruise missiles. A joint program with Army lead, JLENS also performs as a multi-role platform to enable extended range $C^2$ linkages. A key element of the Army transformation Single Integrated Air Picture, JLENS integrates data from multiple sensors and $C^3I$ networks and provides correlated data to $BMC^4I$ nodes.

JLENS is less expensive to buy and operate than fixed wing aircraft and can stay aloft for up to 30 days, providing 24-

hour battle space coverage over extended areas.

**Operational Requirement.** JLENS provides over-the-horizon surveillance and precision track for broad area defense against land attack cruise missiles and also functions as a multi-



purpose aerial platform. JLENS is a key element for communication and range extension (information dominance) and also supports attack operations (ID battlefield targets). Primary missions include land attack cruise missile defense, single integrated air picture, surface moving target indicator and damage assessment. Secondary missions include tactical ballistic missile detection, ground intelligence, communication relay/retransmission, and battlefield awareness.

**Program Status.** Program is in the Concept and Technology Development (CTD) phase of its program life cycle. The program plans to provide a contingency deployable JLENS system [Precision Track Illuminating Radar (PTIR) and Surveillance Radar (SR) with a suite of communications equipment (EPLRS, JTIDS, CEC) elevated via aerostats each with its own processing station, mobile mooring station, and associated ground support equipment] by 4QFY08. First Unit Equipped is planned by 4QFY10. The FY03-07 Plan currently funds the design and development of the PTIR and associated SR risk reduction through CTD culminating in a Milestone B decision in 4QFY04. The program will then enter the System Development and Demonstration (SDD) phase to compete development of the SR and fabricate, integrate, and test the SR with the PTIR to have a complete system by 4QFY08. Upon completion of DT by 4QFY08, a Milestone C decision is planned for 1QFY09 to allow the program to enter production. The JLENS program is currently funded to develop, build and test the PTIR by 4QFY07. Additional funding is required to design, develop, fabricate, integrate and test the SR and system aspects to provide and contingency deploy a robust, highly capable JLENS System. Production of the JLENS System is not currently funded for the FY09-FY16 period.

***Sentinel***

**Description.** Sentinel is a trailer-mounted radar system that detects, tracks, classifies and identifies cruise missiles, UAVs, helicopters, and fixed-wing aircraft to cue SHORAD weapons. It is employed in the division and corps area. Data is fed through the FAAD C2 to

SHORAD weapons to provide air situational awareness to the supported force in the forward area. The system is C-130 deployable. The Sentinel consists of a radar-based sensor system with its High Mobility Multi-purpose Wheeled Vehicle (HMMWV) prime mover, power, IFF, and Command and Control interfaces. The Antenna/Transceiver Group consists of an advanced three-dimensional battlefield air defense radar housed aboard a High Mobility Trailer (HMT) chassis. The radar employs a modern phased array antenna that automatically detects, tracks, classifies, identifies, and reports targets. Targets can be hovering to fast moving, and from the nap of the earth to the maximum engagement altitude of SHORAD weapons. The radar operates at X-band, transmitting a pencil beam. It rotates at 30 rpm (2 second update). The instrumented range and altitude are 40 kilometers and 4 kilometers, respectively. The Sentinel data utilizes SINCGARS AN/VRC-92A and EPLRS AN/VSQ-2 radios. These can provide a track file of more than 60 targets.

**Operational Requirement.** Sentinel provides acquisition, tracking, classification, target location, and identification of cruise missiles, UAVs, helicopters, and fixed-wing aircraft to cue SHORAD weapons into field of view. Sentinel provides air situational awareness to the supported force in the forward area. The AN/MPQ-64 Sentinel radar is the Army's prime contributor of air picture data for Short Range Air Defense (SHORAD) weapons. It provides digitized battlefield information for force protection from hostile air attack, reconnaissance, surveillance, targeting, and acquisition and assists in the prevention of fratricide. It is highly accurate and acquires targets sufficiently forward of the Forward Line of Own Troops to improve SHORAD weapon reaction time and allow engagement at optimum ranges.

**Program Status.** Program completed its primary procurement of Sentinel radars in FY01 and is currently undergoing a P3I program to improve its surveillance and tracking capabilities. Units to be fielded in FY02 include 2nd ACR, 3-265th ADA (FLARNG), and 2-174th ADA (OHARNG). Additional upgrades and systems modifications are currently scheduled through FY08 for many AC and RC units in order to take advantage of advances in technology and SW upgrades. The FY03-07 Plan currently funds procurement of 88 Enhanced Target, Range, and Classification (ETRAC) modifications to the radar. There are two upgrades planned for the Sentinel fleet: Phase 1A improves the radar detection range against low observable and stealthy targets; Phase 1B improves the radar classification of low observable and stealthy targets at extended ranges. The Sentinel Phase IB capability for target airframe classification will support the joint identification and target classification function that allows SHORAD weapons to operate at maximum effectiveness.

## AMD Summary

Although development of AMD programs to meet the needs of the Legacy, Interim, and Objective Forces are presently constrained by limited quantities, technologies, or available funding, AMD

modernization is on track to meet Army Transformation requirements.

While budget constraints will impact the speed at which we develop and field many of the AMD initiatives, current resources available are being focused on those capabilities that are time-critical and that provide the greatest benefits to the force. To ensure effective balance, AMD modernization remains closely synchronized with other Joint Theater Air and Missile Defense (JTAMD) elements to provide effective Full Dimensional Protection of the US Homeland and Army Legacy, Interim, and Objective Forces. High-priority ARNG AMD units have been and will continue to be modernized as new systems are fielded. Conversely, lower-priority ARNG AMD units cannot be modernized at this time due to current funding constraints.

The Ground-based Midcourse (GMD) System is the successor to the National Missile Defense (NMD) system. The GMD system will have the capability to engage ICBMs, potentially armed with weapons of mass destruction, at altitudes that mitigate or negate their effects. GMD will implicitly support Army Transformation, ensuring Army force responsiveness by protecting our ability to mobilize and project power.

## Nuclear, Biological, and Chemical Defense

### Overview

Nuclear, Biological, and Chemical (NBC) systems provide the Army with the enabling technologies of NBC defense, smoke and obscurants to fully achieve force protection, Information Dominance, and Full Dimensional Protection in a Weapons of Mass Destruction (WMD) environment. The Army's NBC defense strategy is to employ "focused defense" against NBC threats so that only units directly affected by the hazard would be warned to take protective measures. Using focused defense, large numbers of units will no longer assume a full protective posture as a precautionary measure. Focused defense allows units to operate in the lowest required protective posture without unacceptably increasing the risk to soldiers. The Army's obscuration strategy is to deny the threat's use of the electromagnetic spectrum while preserving our ability to exploit it at will.

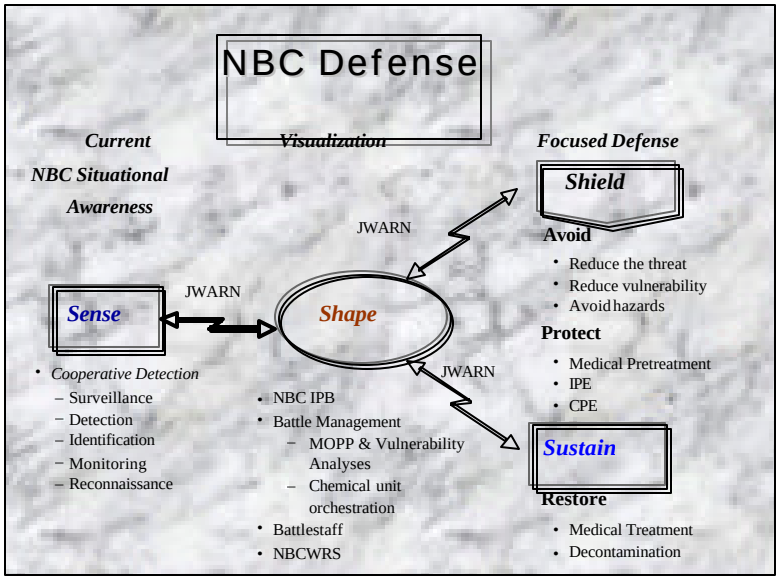
In addition to providing the means of general NBC defense and obscuration common to all units, the Army provides increased NBC defense and obscuration capability with specialized Chemical units. NBC reconnaissance and surveillance units, with their point and standoff detectors, are the principal means of contamination avoidance. Decontamination units restore combat power after units are contaminated. Biological detection companies provide shortened response time for divisions and corps to initiate their medical response to the growing threat of biological warfare agents. Information dominance is supported through development of obscurants that are effective in the visual, infrared, and millimeter ranges.

The NBC defense mission area also includes the Army's efforts to address Homeland Security. Today, the nation is beginning to understand that CONUS

installations and power projection platforms are no longer a sanctuary. The very ability to execute our force projection strategy requires NBC-focused defense over strategic forces and means from pre-mobilization through conflict termination.

## NBC Modernization in Support of Army Transformation

*Chemical Vision 2010* is the implementing vision of the Army's NBC defense modernization effort. It enables the commander to minimize casualties and preserve combat power in an NBC environment and to create information superiority by using obscurants. Operationally, if the enemy has an offensive NBC capability, our primary goal is to deter threat use. If deterrence fails, our mission is to defend against an NBC attack with minimal casualties and degradation, allowing commanders to quickly restore full combat power and continue their mission across the full spectrum of operating environments.




The principles of NBC Defense in *Chemical Vision* are sense, shape, shield, and sustain. The principles of obscuration are sense, shape, shield, attack, and deceive. These principles support the patterns of operations in *Army Vision 2010* (Protect the Force and Information Dominance) and the principles in *Joint Vision 2020* (Full Dimensional Protection and Information Operations).

In providing the NBC defense and obscuration systems for the Army's transformation strategy, the Army will equip its specialized Chemical units and provide NBC defense and obscuration items common to all units in accordance with the three tenets of the Army's overall modernization strategy (1) focusing its Science and Technology efforts on the objective force, (2) meeting immediate operational needs in the interim force, and (3) maintaining and improving the warfighting capabilities of the legacy force through a judicious combination of selected modernization, recapitalization, and sustained maintenance of legacy, but still essential, systems. The following paragraphs will elaborate on just some of the key NBC systems in the Army's modernization plans, realizing there are numerous additional NBC systems in development.

## Homeland Security and Chemical, Biological, Radiological and Nuclear (CBRN) Force Protection

The attacks that occurred on 11 September 2001 clearly demonstrated that the United States is no longer a sanctuary. While the terrorist chose the Pentagon because it symbolizes America's military hegemony, any number of military installations around the country could have been attacked. U.S. Army installations that host initial entry forces, power projection platforms, critical training infrastructure, and force headquarters are high value targets and must be safeguarded.

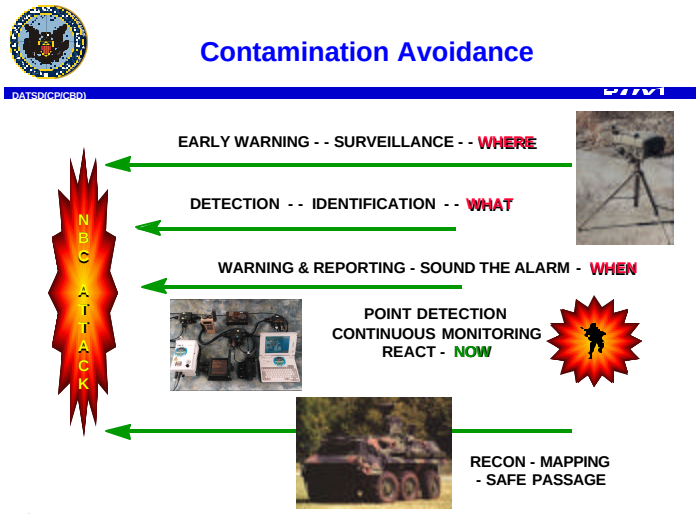
Furthermore, terrorists are no longer limited to high yield explosives such as the one that destroyed the federal building in Oklahoma City. Due to the proliferation of knowledge, technology, and materiel, terrorists are able to employ chemical, biological, radiological (including toxic industrial materials), and possibly nuclear weapons against civilian and military targets in the United States and abroad. Many hazardous chemicals such as ammonia, chlorine, and sulfuric acid are available and can be purchased in a free market society. Biological agents such as anthrax and ricin are easily produced and dispersed.

To protect critical military infrastructure from the effects CBRN weapons in the contemporary operational environment, the Chemical Corps must design and equip new organizations appropriate for responding to the employment of chemical, biological, radiological, and nuclear weapons against U.S. facilities. The CBRN Installation Support Team (IST) will provide an installation commander with a first responder capability. However, due to its limited capabilities and potential need for supporting extended operations, a requirement for more robust teams capable of reinforcing the CBRN-IST exists. These strategically and regionally located CBRN Rapid Response Teams (RRT) will work in conjunction with the regional Medical Command (MEDCOM) Special Medical Augmentation Response Teams–Nuclear, Biological, and Chemical (SMART-NBC) and will provide the commander with the required assets to respond to and mitigate the effects of weapons of mass destruction may have on the installation or local community.

The CBRN-IST is a "matrixed" organization that provides an Installation Commander an organic CBRN response capability. The CBRN-IST reports directly to the Installation Commander and conducts operations in support of the installation anti-terrorism/force protection plan. The CBRN-IST performs chemical, biological, and radiological detection, warning and reporting, and limited decontamination operations, triage and emergency procedures on an installation to minimize casualties and limit the spread of contamination.

The CBRN-RRT provides a MACOM Commander with a full-time, dedicated capability to rapidly augment and reinforce installations following a CBRN incident. The CBRN-RRT is under the operational control (OPCON) of the Incident Commander. The CBRN-RRT pre-positions/deploys to an incident site to augment a CBRN-IST, assess hazards, and advise the Installation Commander/Incident Commander in order to minimize casualties, limit the

spread of contamination, and facilitate restoration operations. It works closely with MEDCOM SMARTs. The CBRN-RRT does not replace the installation's CBRN-IST's ability to respond, but enables the CBRN-IST to sustain operations up to 48 hours. Upon arrival at an incident site, both the CBRN-RRT and a MEDCOM SMART Team integrate with the CBRN-IST and continue supporting CBRN force protection operations.




Finally, the CBRN-RRT begins coordinating remediation operations to restore the installation to fully mission capable.

Before the CBRN-IST and CBRN-RRT can protect U.S. Army installations, each team will receive a CBRN Response Set. Each set will contain both military and civilian-off-the-shelf (COTS) equipment. Equipment such as Level A Suits, Self-containing Breathing Apparatus (SCBA), Portable Biological Aerosol Sampler (PBAS), radiac meters, and portable mass spectrometers will not only protect personnel from the effects of chemical, biological, and radiological hazards, but enable them to detect, identify, and sample the hazards too. In addition to the equipment, all teams will receive the doctrine, training, and certification required.

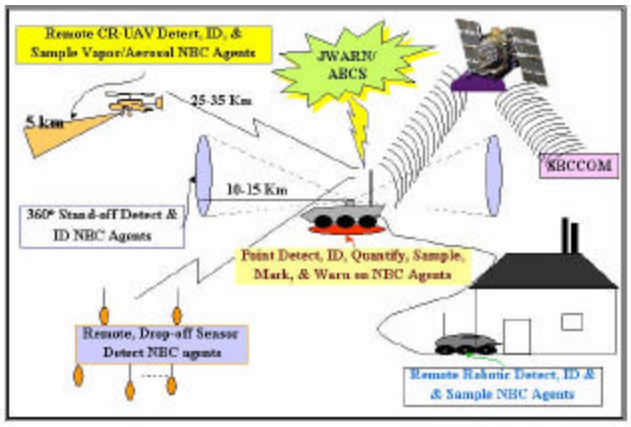
## Contamination Avoidance

Sensing is key to avoid contamination, take protective action, and restore combat power. The goal of sensing is to develop a cooperative detection system that interfaces with current Command, Control, Communications, Computers, Intelligence (C4I) networks and future Battle Management Systems. The cooperative detection system consists of NBC surveillance, detection, identification, monitoring, and reconnaissance elements operating on the existing Command, Control, Communications, Computers, Intelligence, Surveillance, Reconnaissance (C4ISR) architecture and feeds into the NBC Battle Management System. By 2010 and beyond, as both sensor technology and the network mature, sensors will be integrated onto all battlefield systems across all services. These will be smart sensors that detect, identify and warn of all NBC and TIM threats and can be rapidly programmed for new threats as they are developed and used by the adversary.

## Converging Reconnaissance Requirements

There will be a converging of NBC reconnaissance from the separate systems such as the NBC Reconnaissance System (M93 series, commonly called Fox), the biological surveillance (M31 series Biological

Integrated Detection System (BIDS)), and the Light Nuclear Biological Chemical Reconnaissance System (LNBCRS), into a single platform for the Objective Force based on the Interim Armored Vehicle-NBC Reconnaissance System. Current developments, such as the Joint Biological Point Detection System (JBPDS), the Chemical Biological Mass Spectrometer (CBMS), the Short Range Biological Standoff Detection System (SRBSDS), and NBC sensing packages for Unmanned Ground Vehicles and




Unmanned Aerial Vehicles will contribute key capabilities to meeting the needs of the Objective Force.

In accordance with the Army's Transformation Strategy for the Interim Force's IBCT, the Interim Armored Vehicle-Nuclear Biological Chemical Reconnaissance System (IAV-NBCRS) will be based on IBCT operational requirements. The IAV-NBCRS will have surveillance, detection, identification, monitoring, and reconnaissance capabilities. The IAV-NBCRS will also meet lethality, tempo, survivability, and sustainability requirements. The IAV-NBCRS will contain radiation, point biological and chemical, and standoff chemical detection systems integrated into one platform, as well as leverage UAV assets within the IBCT for aerial NBC reconnaissance. IAV-NBCRS will be organized into a three vehicle platoon organic to the Reconnaissance Surveillance Target Acquisition (RSTA) squadron of the IBCT.

**Protection**

Protecting the force from NBC hazards is critical to the success of Army in any battlespace, with the goal of providing Army units the ability to fight and win in a contaminated battlespace. Recent and near-term individual protection developments are producing lightweight, durable protective clothing and masks that are compatible with existing and near-term weapons systems. These new technologies allow for a much lighter burden on the logistics system by increasing the wear life of the suits by 50% (from 30 to 45 days) thus substantially decreasing the demand for sustainment stocks. The Army will begin replacing its current M40 series of protective masks beginning in FY 05 with the next generation mask, the XM 50 Joint Service General Purpose Mask (JSGPM). At the same time the Army will have completed its transition from its current Battle Dress Overgarment (BDO) to the new Joint Service Lightweight Suit Technology (JSLIST) suits, and move to a NBC-Soldier Hydration System for improved capability under NBC conditions. Collective protection will improve for medical units with the fielding of the Chemically

Protected Deployable Medical System (CPDEPMEDS) and the Chemical Biological Protective Shelter (CBPS) at the battalion level. Collective protection for the IAV will consist of a ventilated facepiece system.

## Decontamination

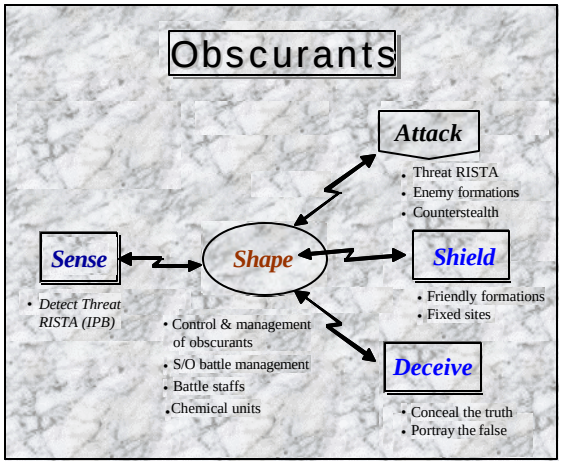
The ability of U.S. Forces to conduct decontamination is an essential component of force protection. Today's Army must be prepared to fight in a contaminated environment. Having the capability to remove, neutralize, or destroy such contamination is a key component in restoring the combat power of units.

Lessons learned from the past show that current decontamination methods and capabilities are inadequate to keep pace with the Army transformation. Units must be able to decontaminate faster, more effectively, with minimum amounts of water and without damaging sensitive equipment while sustaining operations Developing decontaminants, delivery apparatus, and doctrine are ongoing efforts that will help to ensure survivability in contaminated environments.

The future decontamination system concept is to be capable of conducting thorough, fixed site and terrain decontamination operations with the same equipment and decontamination on the move. Using the HEMTT-Load Handling System/Decon provides for a common platform and reduced logistical footprint while facilitating critical NBC Decon operations in complex and/or restrictive terrain.

For the Legacy Force, existing M17 Lightweight Decontamination Systems (LDS) will be maintained. Chemical Corps dual-purpose (smoke/decon) units will be equipped with the Modular Decon System (MDS). The Objective Force will be equipped with the new decontaminants and applicators that ultimately are selected from the Joint Sensitive Equipment Decontamination (JSSED) program and the Joint Fixed Site Decontamination (JSFXD) program such as HEMTT-LHS/Decon.

## Obscuration




With the rapid proliferation of advanced target acquisition systems and advanced weapons, the commander must not only protect his situational awareness, but also

degrade the adversary's capability. The five principles for obscurants found within the Chemical Corps Vision of “Sense, Shape, Shield, Attack and Deceive” provide the framework to degrade an adversary’s situation awareness. Obscurants support the war fighter by providing him with a capability that allows him to attack an enemy’s target acquisition systems across the electromagnetic spectrum.

Smoke systems for the Legacy Force, providing visual and IR smokes only, will remain with the current M56 motorized smoke system (HMMWV mounted). A Millimeter Wave (MMW) capability is programmed for the M56 in both the Legacy and Objective force. For the mechanized units of the Legacy Force the current M58 (M113A3 mounted) smoke system will be maintained but is not funded to provide an MMW capability. Addition of the MMW capability for the M58 is an unfunded requirement to support both the Legacy and Objective Forces. Obscurants for the interim force IAV will consist of a rapid multi-spectral self-obscuration grenade system.

**Discussion of Key Equipment**

***M93/M93A1 Nuclear Biological Chemical Reconnaissance System (Fox)***

**Description**. The Nuclear, Biological and Chemical Reconnaissance System (NBCRS)–Fox Block I Modification (M93A1) contains an enhanced NBC sensor suite consisting of the M21 Remote Sensing Chemical Agent Alarm (RSCAAL), MM1 Mobile Mass Spectrometer, Chemical Agent Monitor/ Improved Chemical Agent Monitor (CAM/ICAM), AN/VDR-2 Beta Radiac, and M22 Automatic Chemical Agent Detector/Alarm (ACADA). The NBC sensor suite has been digitally linked with the communications and navigation subsystems by a dual-purpose central processor system known as the Multipurpose Integrated Chemical Agent Detector (MICAD). The MICAD processor fully automates NBC warning and reporting functions and provides the crew commander with full situational awareness of the Fox’s NBC sensors, navigation, and communications systems. The M93A1 Fox is also equipped with an advanced navigation system Global Positioning System (GPS) and Autonomous Navigation System (ANAV) that enables the system to accurately locate and report agent contamination. The mobility platform is a six-wheeled, all-wheel-drive armored vehicle capable of cross-country operation at speeds up to sixty-five mph. The Fox System is fully amphibious with swimming speeds up to six mph. As a reconnaissance vehicle, it can locate, identify, and mark chemical/biological agents on the battlefield. The Fox usually accompanies the scouts or motorized reconnaissance forces when performing its NBC mission. It has an over-pressure filtration system that permits the crew to operate the

system in a shirt-sleeve environment that is fully protected from the effects of NBC agents and contamination. The M93A1 system is operated by a three-person crew (legacy systems require a four-person crew). The M93A1 will be one of the few systems fielded with a fully interactive class 4/5 electronic technical manual (IETM).

**Operational Requirement.** Detect, identify, and mark areas of nuclear and chemical contamination; sample for nuclear, biological, and chemical (NBC) contamination; and report accurate information to supported commanders in real time.

**Program Status**. 1QFY99 First unit equipped. Remaining systems scheduled for conversion and fielding through 4th qtr FY 03.

***M31/M31A1 Biological Integrated Detection System (BIDS)***

**Description**. The BIDS consists of a shelter mounted on a dedicated vehicle (M1097A1 HMMWV) and equipped with a biological detection suite employing complementary technologies to detect large area biological attacks. It can detect all types of BW agents in less than 10 minutes, and identify any 8 agents simultaneously in less than 30 minutes.

**Operational Requirement**. As an Army Corps level asset, the BIDS mitigates the effects of large-area biological attacks during all phases of a campaign. Individual BIDS systems are employed throughout the Corps area to create a sensor array/network. The BIDS network is used for warning and confirming that a Biological Warfare (BW) attack has occurred and will provide a presumptive identification of the BW agent being used.

**Program Status**. The NDI version of the BIDS has been fielded to the 310th Chemical Company (Reserve) and the P3I version has been fielded to the 7th Chemical Company (Bio).

***M17 Lightweight Decontamination System (LDS)***

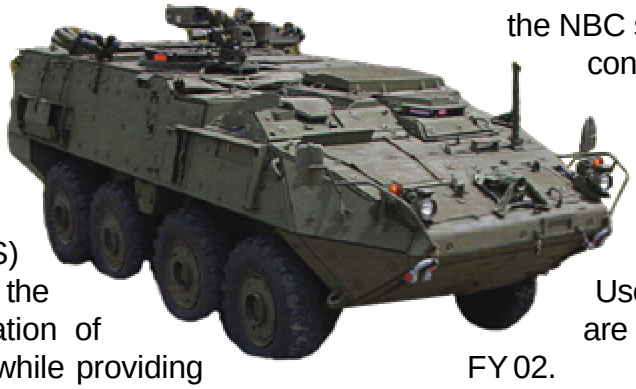
**Description**. The M17 system includes a pumper/heater module, an accessory box and a 3000 gallon rubberized fabric, collapsible water tank.

**Operational Requirement**. The M17 is used for hasty or deliberate equipment decontamination at the battalion level.

**Program Status**. Fielding complete.

***Interim Armored Vehicle- NBCRS***

**Description**. The IAV-NBCRS will incorporate the Block II NBCRS integrated chemical and biological point detectors that will allow on-the-move standoff biological and chemical agent detection. The Chemical Biological Mass Spectrometer (CBMS) Block II will improve the detection and identification of liquid chemical agents while providing a first-time biological agent detection capability to the reconnaissance platform. The Block II sensor suite will automatically integrate contamination information with data from on-board navigation and meteorological systems and rapidly transmit contamination hazard and clear area intelligence to the appropriate operations center. Integration of the common NBC technical architecture will allow for expansion/upgrading of the on-board computers at minimal cost, as well as the command and control of NBC sensing Unmanned Aerial Vehicles and Unmanned Ground Vehicles in the Objective Force System.



**Operational Requirement**. The IBCT will potentially operate in a nuclear, chemical, and biological environment, which could include weaponized agents, toxic industrial hazards, and battlefield residues. The IAV-NBCRS must be capable of hosting existing and planned NBC detection capabilities to enable Army Divisions to dominate across the full spectrum of operations.

**Program Status**. The IAV-NBCRS development program completed the critical design review (CDR) for the NBC Sensor Suite in Sep 00. Hardware procurement and software coding has been initiated. A demonstration of the NBC sensor suite was conducted in Apr 01. Engineering Development Test (EDT) and Limited User Test (LUT) are planned for FY 02. Milestone C is scheduled for 1st Quarter FY 03 and will allow the start of low rate initial production (LRIP). Production Verification Testing (PVT) and Initial Operational Test and Evaluation (IOT&E) are planned for FY03/04.

## Summary

Among the significant changes to the future strategic environment, proliferation of WMD is recognized as a principal asymmetric threat capable of providing an adversary military advantage to neutralize overwhelming conventional superiority. Having an effective NBC defense is a necessary component of any defense strategy that seeks to demonstrate to the adversary that use of WMD will not gain the advantage sought. Modernizing the force while conducting a robust S&T effort is critical to preventing technological surprise from new Chemical/Biological (CB) agents or different employment means. Recapitalizing and maintaining the current force is necessary to enable Transformation and mitigates risk by extending the useful life of current

systems within fiscal constraints. This modernization plan assures a disciplined approach to meeting mission-based requirements and secures orderly change as we transition to the Objective Force.

Nevertheless, although significant and measurable progress has been made to enhance survivability and sustain operations after an NBC attack, current fiscal constraints have inhibited our ability to establish and maintain information superiority by countering an adversary's reconnaissance surveillance, and target acquisition sensors. Unless additional resources are provided, we will not be able to take full advantage of our ability to obscure battlefield sensors operating in the millimeter wave region of the electromagnetic spectrum. This capability must be included in both the Legacy and Objective Forces as we transform from platform survivability to force survivability.

# Precision Engagement

## Overview

**Precision Engagement** is the ability of joint forces to locate, discern, and track objectives or targets; select, organize, and use the correct systems to engage or attack; generate desired effects; assess results; and reengage with decisive speed and overwhelming effect, as required, throughout the full range of military operations.

Precision engagement is effects-based engagement that is relevant to all types of operations. Its success depends on in-depth analysis to identify and locate critical nodes and targets. The pivotal characteristic of Precision Engagement is the linking of sensors, delivery systems, and effects.

It is imperative that future Fire Support warfighting Operational and Organizational (O&O) concepts be nested in the Army Vision. To properly align the Fire Support Battlefield Operating System with Army Transformation, the following imperatives are essential. These include:

- Fires must operate within a joint and combined "System of Systems."
- Fires must have the same strategic deployability and tactical mobility as maneuver.
- Fires must maximize commonality of organizations and equipment.
- Fires must capitalize on munitions lethality to reduce our logistics footprint.
- Fires are dependant on the Army National Guard (ARNG) to provide required combat power.
- Fires must fully leverage information technologies in order to be relevant.

Challenges abound in developing fires capable of meeting the requirements above. These include:

- Most of our current and emerging capabilities were created to offset the Soviet threat on European terrain. Desert Storm requirements were similar. Future capabilities must be adapted to new requirements.
- Effects were largely dependent upon massed fires and area targets. This is not likely to be the case in the future.
- There will be a continuing need to engage mobile, time-critical targets.
- Many of our current target acquisition assets are not discriminatory in depicting paramilitary and unconventional forces. This discrimination is likely to be a future need.
- Fusion of intelligence for targeting is starting to emerge but, in many cases, lacks real-time speed.
- Many countries have overmatch capability in quantity or range for precision strike capability.

- Proliferation of threat forces that can use sanctuary positions with the protection of urban and complex environments is keyed to the perception of the U.S. aversion to unrestricted collateral damage.

These challenges will generate and necessitate changes of varying degrees that affect our Doctrine, Training, Leader Development, Organization, Materiel, and Soldier Systems (DTLOMS). As the Army continues to evolve to meet future requirements, Fire Support must and will continue to evolve as well.

## Fire Support Modernization in Support of Transformation

### Legacy Force

Near-term modernization actions consist of both equipment modernization and equipment recapitalization necessary to achieve the maximum capability within the allocated budget. Equipment modernization strives to make incremental changes to existing systems, embedding situation awareness and maintaining digitization momentum while extending their lives and maintaining their overmatch until they can be replaced. Fielding of Crusader to the Counterattack Corps and subsequently cascading M109A6 Paladins to displace older M109 series howitzers in the inventory, upgrading of the Firefinder radar, and fielding of Advanced Field Artillery Tactical Data System (AFATDS) are key to this effort. The recapitalization of the MLRS (M270A1), the AN/TPQ-36 Firefinder Radar, and the Field Artillery Ammunition Supply Vehicle (FAASV) will extend the useful life of this equipment and consequently enhance substantially the warfighting capability of the Counterattack Corps.

To shape the battlespace and conduct decisive operations, the Army will move towards munitions centrality. Rockets and missiles will be developed and procured which extend their range and lethality and provide the Corps commander with a true organic deep strike capability. The Army will also begin production of smart and brilliant munitions, greatly increasing lethality against selected high-value targets while decreasing ammunition, and thus logistical, requirements.

### Interim Force

In the mid-term, the Army will complete development and begin to field systems required to fully support the requirements of the Interim Force. We will begin procurement of some of the next generation of systems in support of both light and heavy forces. Key among these are the Crusader howitzer system, the lightweight 155mm (LW155) howitzer, the High Mobility Artillery Rocket Systems (HIMARS), and the AN/TPQ-47 Firefinder Radar System. LW155 and HIMARS will replace most M198 howitzers in the Army and provide a mobile, deployable deep strike capability for early entry operations. LW155 will also be fielded to the Interim Brigade Combat Teams (IBCTs) beginning in FY06. HIMARS, while not organic to the IBCTs will also be available to provide deep fires as needed. Munitions centrality will continue with a suite of long-range precision strike weapons that compensate for a smaller force and a Firefinder AN/TPQ 47 radar capable of targeting at operational depths. Profiler, the next generation

meteorological system, will be fielded to the entire Force and will provide for target area meteorological information critical to accurate fires.

## Objective Force

In the far-term, munitions science and technology should provide for the ability to develop, test and evaluate, and procure smaller, lighter, more mobile weapons platforms capable of effective fire support throughout the battlefield. There are a number of FCS designs currently being considered by the Army, and no decision is expected for several years. Crusader, recently designated as a legacy-to-objective system, will operate within the Objective Force. This revolutionary cannon system will provide indirect fires accurately to 50km across the full spectrum of conflict. HIMARS P3I will provide a lightweight, deployable weapons platform to support the Objective Force Division and EAD with Guided MLRS (GMLRS) and ATACMS missiles. This platform will be developed to support specific munitions. Technological advances will be applied to target location accuracy, artillery acquisition, and area meteorology systems in support of the Objective Force. Advances in composite materials and ballistic protection technology will be applied to existing systems to reduce weight and increase deployability.

## Description of Key Equipment

### ***Crusader***

**Description.** Crusader is the Army's highest priority fire support system and a technology carrier for future DoD systems. Crusader is a fully automated, networked, robotic, fire support system consisting of a self-propelled, 155mm howitzer and its dedicated resupply vehicle. This system provides significant increases in range, accuracy, rate of fire, lethality, mobility and survivability over the current M109 series fleet.

**Operational Requirement.** Crusader will be the indirect fire support system providing fires in support of maneuver forces on the future battlefield. Crusader enables the United States to regain indirect fires dominance, while maximizing the total capabilities of the Brigade Combat Team, by unleashing the maneuver force. Crusader will be the keystone fire support system of the Army's Counterattack Corps and an integral component of the future Army as the Army's legacy-to-objective cannon system. Crusader provides a strategically mobile, cost effective program, providing full-spectrum fire support for maneuver forces. Crusader will increase the overall combat effectiveness of the total force by up to 53%, while reducing the logistics burden 15-25%. The system provides three times the operational capability of current systems with the same strategic lift. Crusader will revolutionize the future battlefield providing unmatched rate of

fire, responsiveness and accuracy. Crusader restores U.S. Army fire support dominance.

**Program Status.** Crusader is on track to begin fielding in FY08. Milestone B is presently scheduled for 3QFY03. The program is fully funded as we look to procure 480 systems.

## ***ATACMS***

**Description.** ATACMS missiles are the Army or Land Component Commanders' organic deep strike weapons to support Joint Force operations. The ATACMS program is a classic spiral developmental effort with missiles being developed in a logical series of improvements to range, accuracy, or lethality. Missile production is continuous. Each new block improvement, when ready, cut into the existing production line. ATACMS Block I proved its effectiveness during Operation Desert Storm.

**Operational Requirement.** ATACMS Block IA increases maximum range from 165km (Block I) to 300km, by reducing the number of Anti-Personnel/Anti-Materiel (APAM) bomblets in its payload, but greatly increases accuracy and precision attack effects by incorporating GPS-augmented guidance. Block I and IA missiles are effective against anti-personnel/anti-materiel soft targets. ATACMS Block II (in LRIP) significantly improves lethality and expands the target set by incorporating BAT brilliant anti-armor submunitions to effectively engage moving armor formations. Incorporation of the P3I BAT submunition in the Block II missile will further expand the target set to include moving or cold, stationary high value targets including Multiple Rocket Launchers (MRL), Surface-to-Surface Missile Transporter Erector Launchers (SSM TEL) and threat Air Defense Artillery (ADA) sites. The ATACMS Unitary missile will accurately engage point targets, at ranges to 270km, with minimal collateral damage Blocks IA, II, and ATACMS Unitary will be fired from HIMARS, and from HIMARS P3I launchers thereby support early entry Objective Force unit. Legacy Counterattack Force M270A1 launchers can also fire them; thus providing a critical capability during the interim period of operational risk while the Army transforms.

**Program Status.** The ATACMS program is currently being restructured to increase developmental and system characterization work. As a result the Army decision was to limit Block II-BAT procurement and focus on Block II-P3I BAT procurement. Block II/P3I BAT LRIP procurement begins in FY04 with an FY06 Initial Operational Capability (IOC). A small number of ATACMS Unitary missiles (43) procured under a Quick Reaction Program funded by Congress in FY01 have been delivered. Blocks IA, II, and ATACMS Unitary will be fired from HIMARS, and from HIMARS P3I launchers, supporting early entry, interim, and objective forces. Legacy Counterattack Force M270A1 launchers will also fire them; providing a critical capability during the period of operational risk while the Army transforms. The ATACMS program is being restructured

during the budget planning process. Block II/BAT procurement will be limited. Block II/P3I BAT LRIP procurement begins in FY05 for an FY06 Initial Operational Capability (IOC). A small number of ATACMS Unitary missiles under a Quick Reaction Program funded by Congress in FY01.

***Guided MLRS (GMLRS) Rocket***

**Description.**

GMLRS supports the Objective Force by providing division and corps commanders with a precision munitions capability to ranges of 15- 60KM. GMLRS is a major upgrade to the M26 series MLRS rocket that integrates a GPS-augmented Guidance and Control (C&C) package and a new rocket motor to achieve greater range and precision accuracy. The improvement in accuracy (<3Mil CEP) will reduce the number of rockets required to defeat targets at 60KM or greater ranges, reduce the number of launchers required per fire mission, reduce collateral damage, and directly contribute to reducing the logistical footprint of Objective Forces. A self-destruct fuze will reduce hazardous duds to <1%. Guided MLRS Unitary (GMLRS-Unitary) will provide Objective Forces with a low-collateral damage rocket, capable of destroying high payoff surface targets in complex and urban terrain, with pinpoint accuracy.

**Operational Requirement.** GMLRS rockets will replace M26 Rockets. The M26 rocket will begin shelf life expiration in FY07 and will be completely expired by FY16. GMLRS and GMLRS Unitary will be fired from HIMARS, and from HIMARS P3I launchers, supporting early entry, interim, and objective forces. GMLRS and GMLRS-Unitary will also be fired by Legacy Counterattack Force M270A1 launchers; providing a critical capability during the period of operational risk while the Army transforms.

**Program Status.** GMLRS Engineering and Manufacturing Development (EMD) is an International Program with the United Kingdom, Germany, France and Italy, and with a RDTE 50/50 cost share agreement between US and European partners. The United States is managing the prime contract. Low-rate initial production is planned to start in FY03. The programmed GMLRS IOC is 2QFY06. GMLRS Unitary is in concept development, and requires funding for RDTE.

***High Mobility Artillery Rocket (HIMARS)***

**Description.** The current HIMARS is a Legacy to Objective System. HIMARS will provide early entry forces with MLRS capability in a lighter weight, more deployable system. Mounted on a medium tactical vehicle, HIMARS is transportable, fully combat loaded, on a C-130 aircraft. It provides full MLRS Family of Munitions capability yet requires 70% fewer airlift resources to transport a battery.

**Operational Requirement.** The High Mobility Artillery Rocket System is a C-130 transportable, wheeled version of the MLRS launcher that is mounted on a five ton Family of Medium Tactical Vehicles (FMTV) truck chassis. It will fire the entire MLRS family of rockets and missiles. HIMARS has the same command, control, and communications (C3), as well as the same three-man crew, as the M270/A1 launcher, but carries only one rocket or missile launch pod/container, containing one Army Tactical Missile or six rockets. The HIMARS program has been accelerated to achieve fielding of two battalions in FY05 versus one. HIMARS will be fielded to both AC and RC battalions supporting early entry, Interim, and Objective Forces. The HIMARS P3I will support the Objective Force.

**Program Status.** HIMARS participated in the Rapid Force Projection Initiative (RFPI) Advanced Concept Technology Demonstration (ACTD) in 1998. On 26 September 2000, Headquarters, Department of the Army (HQDA) approved XVIII Airborne Corps Artillery retention of three prototypes as an operational capability until HIMARS fielding in FY05. HIMARS is in Engineering and Manufacturing Development (EMD). FUE is programmed for 2QFY05. The Marines plan to acquire a total of 45 launchers for an FY08 Initial Operating Capability.

***Mortars***

**Description.** The Army continues to seek improvements in indirect fire systems that directly support Light forces to improve overall lethality, survivability and sustainability on the battlefield. Rapidly responsive and accurate mortars cannot only place fires at the right place but can mean the difference in the tactical fight where time is critical.

**XM95 Mortar Fire Control System (MFCS).** The MFCS will provide a Paladin like capability for the carrier mounted 120mm system (M1064), with future applications for the Interim Armored Vehicle–Mortar Carrier (IAV-MC), towed 120mm system, and man-transportable 81mm system now in development. The onboard navigation and tube laying capability will reduce call for fire to less than one minute, which is the hallmark of the "shoot and scoot" capability to ensure survivability against enemy counter fires. Its accuracy reduces the CEP of standard ammunition by nearly 400%.

**Operational Requirement.** Mortars serve multiple users with a wide variety of munitions. Their low system weight, high rate of fire, and high angle of attack makes them ideal for providing overwhelming indirect fire effects with a low logistics' burden on today's and the future battlefield. 120mm mortars are mounted in tracked carriers (M1064) for the Heavy & Mechanized Divisions, or towed behind HMMWVs for Armored Cavalry Regiments. 60mm and 81mm mortars are the Company and Battalion fire support assets for Light Divisions.

**Program Status.** Mortar programs are funded through FY07.

**Target Acquisition**

The Army continues to develop systems to acquire and target the enemy with increased range and precision. Key to decisive victory is detection, acquisition, and engagement of enemy platforms in direct and indirect engagements. Two

systems available to enhance our ability to acquire, target, and defeat enemy forces are the Lightweight Laser Designator Rangefinder (LLDR) and the AN/TPQ-47 (Q47) Firefinder Radar.

***Lightweight Laser Designator Rangefinder (LLDR)***

**Description**. The LLDR is a man-portable, thirty-five pound, long-range fire support targeting sensor that significantly improves the commander's ability to shape the battlefield through use of indirect and precision fires (artillery, close air support, precision-guided munitions). LLDR can accurately locate, identify, range, self-locate, determine azimuth, vertical angle, and designate hard or soft, stationary or moving targets. LLDR replaces the Ground/Vehicular Laser Locator Designator (G/VLLD) and associated first generation night sight (AN/TAS-4) with a state-of-the-art lightweight targeting system. LLDR, a second generation Forward Looking Infra-Red system, consists of: day imager sensor and optics, thermal imager and optics, GPS, compass, display, laser designator/rangefinder, tripod, system controller, battery and enclosure. LLDR also has the capability of being remotely operated, to include remote laser designation.

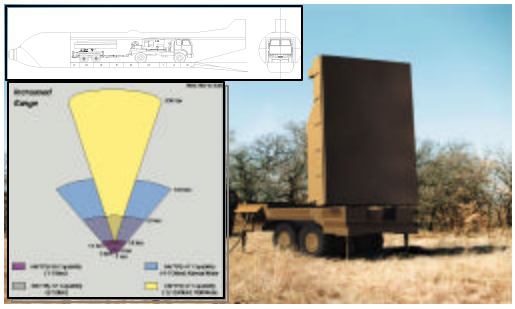
**Operational Requirement**. Our light, interim, and heavy forces must have the ability to locate, identify, and designate during day and night to provide combat overmatch in symmetrical and asymmetrical environments. Special operations, legacy, interim, and objective force commanders utilize the LLDRs capabilities in portable dismounted and mounted configurations. LLDR provides them with the ability to See First, Understand First, Act First, and Finish Decisively.

**Program Status.** FY02 is the first year of production for LLDR. The Commander, Special Operations Command, and the Commander, 82nd Airborne Division, have articulated their urgent requirements for this system. The Army will continue to fund and procure this system until fielded to the total force.

***AN/TPQ-47 Firefinder Radar***

**Description.** The AN/TPQ-47 Firefinder Radar (Q47) is a highly mobile mortar, artillery, rocket, and tactical missile locating radar. It is capable of detecting missiles to 300 kilometers (k), rockets out to 100k, artillery out to 60k, and mortars to 30k. The system will classify each acquisition as mortar, artillery, rockets, or missiles. The Q47 performance is tailorable to the tactical mission. The Q47 will provide continuous responsive target acquisition throughout all phases of combat operations. Airlift of mission essential equipments requires one C-130 reducing by two sorties the requirement for lift from its legacy system. Enhancing targeting at all echelons of operations, the Q47 is integrated into the targeting structure by interfacing with such systems as current and projected Unmanned Aerial Vehicles (UAVs), Theater Missile Defense (TMD) systems including

Theater High Altitude Area Defense (THAAD), and joint systems such as the Joint Surveillance and Target Attack Radar System (JSTARS) through it's interface with the Advanced Field Artillery Tactical Data System (AFATDS).



**Operational Requirement**. The Q47 is a component of Interim Brigade Combat Teams (IBCTs), Division Target Acquisition Batteries, and Corps Target Acquisition Detachments. In IBCTs the Q47 will provide coverage against artillery fires for over 95% of an IBCT's engagement area. Its rocket and missile mission will allow the maneuver commander to 'see' into the next operational environment providing an intelligence asset unmatched by other forces. The Division and Corps commanders will maximize the Q47s rocket and missile detection capabilities by seeing deep, using the systems detection capabilities, and shaping the future battlefields. The Q47 is also suited for Stability and Support Operations (SASO). Its predecessor, the Firefinder AN/TPQ-37, was instrumental in enforcing the Dayton Peace Accords in Bosnia. The Q47s increased target and impact predict capabilities will allow Task Force and SASO Commanders to identify and accurately locate indirect mortar and artillery fires.

**Program Status:** The first AN/TPQ-47 is in construction at the manufacturing facility. Electronics and software integration is ongoing, and developmental and operational testing is scheduled in FY03 and FY04. First Unit Equipped is scheduled for FY05.

## Summary

As we move through Transformation, it is essential that we selectively modernize and recapitalize the existing force designed to maintain and improve our war-winning edge over any potential adversary. At the same time, fielding the IBCTs will fill an existing capability gap between responsive light forces and the dominant lethality and survivability of our heavy forces. Our strategy requires a combination of near-term tradeoffs and selective force modernization. It balances today's operational requirements for warfighting with development of new technologies and systems to meet the operational requirements of tomorrow's force. The end state is to develop Objective Force fires that are more responsive, lethal and more precise than today's. Programs, to include Crusader, Firefinder, LW155, ATACMS/P3IBAT, and HIMARS must remain on track. Equally important are our munitions enablers to ensure warfighting capabilities throughout Transformation. Both precision munitions and common platforms are essential to reducing the logistics footprint associated with area munitions and for ensuring our relevance in urban and complex terrain. Thus, the need to restore funding for a viable program for Excalibur with integrated "smart" munitions is essential.

# Focused Logistics

## Overview

The goal of Focused Logistics is to provide to the Army and other supported forces the right supplies and services, at the right place, at the right time. Accomplishment of that goal is and will continue to be the expectation and requirement of the warfighter. As the Army transforms to a capabilities-based force to meet a variety of potential threats, combat service support (CSS) must also transform to ensure logistics transformation is synchronized with the needs of the force and is consistent with the Army's goals. The transformation of those elements that arm, fuel, fix, move, maintain, and sustain the force is an integral part of creating an Objective Force that is more deployable, agile, lethal, and survivable.

## Focused Logistics Goals

The three main goals of the focused logistics transformation are enhanced strategic responsiveness, reductions in logistics costs, and reductions in the logprint. Logprint is defined as the personnel, supplies, services, maintenance, materiel, and transportation required to provide logistics support to the force across the spectrum of operations. The accomplishment of these three goals is predicated on advances in equipment, technology, organizations, and business practices.

## Focused Logistics Modernization in Support of Transformation

The process of modernizing CSS and focused logistics is well underway, and the investment strategy is accurately aimed at those systems and technologies which will ensure that sustainment operations of the future provide the support required by the Objective Force. At the same time, the investment strategy must ensure that currently fielded systems are upgraded to continue to support the Army that must be prepared to fight and win the Nation's wars now and in the near and mid-term. This requirement to span generations of technology is not new. Army logisticians have always been confronted with the support requirements of forces with wide ranges of technological advancement, and varying levels of modernization. The difference now and in the immediate future is that this imperative is likely to increase in significance as organizations become more disparate in structure and equipment through the transformation process. As a result, there will be an even greater demand on sustainment resources to span this technology gap between modernized and modernizing forces. In response to this requirement, the investment strategy for Focused Logistics is designed to address and meet the requirements of the Legacy, Interim and Objective Forces.

## The Legacy Force

CSS modernization for the Legacy Force is a combination of the continued fielding of new systems, and the recapitalization of fielded systems with proven utility. These ongoing efforts bring us closer to the primary goals of our CSS transformation strategy, and the building blocks of that strategy are the key logistics enablers that will provide assured sustainment across the spectrum of operations. An enabler is defined as a materiel solution, automation or communications system, technology, business process change or organizational redesign, which yields a new or enhanced capability to meet a recognized requirement. Key logistics enablers currently being fielded to the Legacy Force include the Family of Medium Tactical Vehicles (FMTV) that replaces 21/2 and 5 ton trucks throughout the force structure. FMTV will contribute significantly to meeting the requirement for commonality among systems to simplify maintenance operations. FMTV is also being fielded to the Interim Force.

Other examples of systems being fielded to the Legacy Force that reduce the logprint are the Heavy Expanded Mobility Tactical Truck (HEMTT) and the Containerized Kitchen (CK). The HEMTT is fielded in various configurations including crane, wrecker, tanker, and load-handling variants which share common major components thereby reducing the requirement for repair parts and for different types of maintenance personnel. The CK replaces the Mobile Kitchen Trailers on a one-for-two basis, streamlining food service operations through reductions in personnel as well as in hauling and storage requirements. These trucks that are built on a common chassis, and the field kitchen that leverages technology for more efficient operations contribute directly to reducing the logprint on the battlefield.

The second element of the plan to maintain and enhance the capabilities of the Legacy Force is the recapitalization of the HEMTT and the High Mobility Multipurpose Wheeled Vehicle (HMMWV). Both are currently fielded systems with proven battlefield utility that will be made more capable, more reliable, and more maintainable through the upgrade and/or replacement of key components. This process helps to achieve our goal of reducing the cost of logistics by maximizing the useful life of a fielded system until the Future Tactical Truck System is developed to replace the HEMTT as well as the follow-on to the HMMWV, and incorporating advanced technology to reduce operating costs.

## The Interim Force

The fielding of modernized logistics systems to the Interim Force is ongoing. While there are no CSS systems designed exclusively for the Interim Force, those units are receiving modernized CSS systems currently in development that will enhance their deployability, sustainability, and reliability of the Interim Force. An example of this is the medical logistics module of the Medical Communications for Combat Casualty Care (MC4) system. This module is only one of ten that will eventually be fielded, but its capability to accelerate medical resupply and significantly reduce stockpiles makes it an invaluable asset in transforming the Army to the Interim and Objective Forces now.

## The Objective Force

The Objective force CSS structure will be built around the immutable truth that sustainability must be given equal importance with the other warfighting imperatives such as lethality, deployability, and survivability. This is emphasis in sustainability is essential to ensure that logistics is inextricably linked to operations, and that the logistics tempo is equal to the operations tempo. Achieving this will be dependent on the implementation of key concepts such as velocity management; anticipatory as opposed to reactionary logistics; demand reduction with regard to power, fuel, and hauling capability; reach capability– encompassing reach back, reach laterally, and reach forward; and agility to allow for the rapid redirection of resources as needed.

Our investment strategy for the Objective Force focuses on systems that will improve deployability and responsiveness, reduce the in-theater logprint, and reduce costs through efficiencies. The Theater Support Vessel (TSV) will provide intra-theater lift that will enable the Intermediate Staging Base (ISB) concept by providing responsive and capable lift immediately available to the operational commander. The TSV will mitigate the limitations imposed by undeveloped Sea and Air Ports of Debarkation, and will enhance flexibility within a theater of operations.

Advances in Test, Measurement, and Diagnostics equipment as well as Embedded Diagnostics and Prognostics, through the Army Diagnostics Improvement Program will enhance maintenance operations by enabling multi-capable maintainers to electronically detect, isolate and identify faults and fault trends. This will provide the capability to then forecast requirements and order replacement parts in advance of failures, thereby contributing significantly to the elimination of the “Iron Mountain” of the past, and optimizing of the concept of velocity management. This capability will initially be achieved by appliqué of sensors and devices on legacy platforms, and will ultimately be an embedded component of Objective Force systems. Commanders will gain confidence that the process of anticipating requirements and having what’s needed, where and when it’s needed will eliminate the demand for large stockpiles of repair parts and replacement equipment, and maintenance personnel will be able to make necessary repairs to systems before they fail, improving readiness and keeping combat systems in the fight.

One of the most resource-intensive commodities on the battlefield is fuel. Reducing the logprint imposed by the current requirement for various types of fuel on the battlefield is achieved by the replacement of gas-burning equipment with diesel-based fuel systems such as the Modern Burner Unit. Initiatives such as this will eliminate the requirement for multiple types of fuel, thereby reducing and simplifying the requirements for transport and storage.

Automatic Identification Technology enables In-transit Visibility for Total Asset Visibility. These key enablers provide Army logisticians the capability to monitor deployments and cargo movements, divert crucial shipments, and locate critical assets to redistribute to meet user

requirements. The Movement Tracking System and the Transportation Coordinator's Automated Information Management System II that will allow decision-makers to make on-the-spot adjustments to the distribution of resources will facilitate agility on the battlefield, and in transit to the battlefield.

CSS transformation will also focus on our most valuable resource, our Soldiers. Several initiatives are ongoing which will improve the working and living conditions, and field services that maintain the health, safety and welfare of our Soldiers upon deployment. These are not luxury systems, but are those systems that contribute directly to the enhanced ability of our Soldiers to perform their mission in a variety of conditions and unit configurations. Modernization of Soldier systems is ongoing in areas as diverse as field services, with advanced laundry and bath systems to aerial insertion means such as the Advanced Tactical Parachute System that reduces parachute-landing injuries by decelerating the rate of descent for personnel in airborne operations.

As with all battlefield operating systems, robust and extensive communications and automation are essential to optimize the performance and value added of modernized systems. Logistics Assured Communications is critical to achieving distribution-based logistics and overall CSS transformation goals. Communications connectivity from the tactical to the strategic levels of logistics will ensure optimization of other changes in processes, organizations, doctrine, and platforms. It is achieved through a synergistic information and communications environment dominated by an integrated and interoperable global, wireless, and assured communications and information technology system designed to operate on a 24/7 basis virtually anywhere on the battlefield or in the world. For the objective force, the Combat Service Support Control System and the Global Combat Support System-Army will provide those capabilities. The source of a significant portion of the data processed by these systems is the Logistics Integrated Data Base, which has synthesized information on legacy systems to provide decision-makers real-time logistics data such as readiness and property book information, maintenance status, and recommended stockage lists. The synergistic effect of these systems will be a reliable and accessible network that will support logistics business, command and control, and situational awareness from the tactical to the strategic levels. The benefits to the warfighter are total asset and in-transit visibility, logistics packages tailored to a specific requirement, quick response distribution and redistribution of supplies, and real-time and continuous access to the common operating picture.

## Discussion of Key Equipment

### ***Heavy Expanded Mobility Tactical Truck (HEMTT)***

**Description**. The HEMTT is an 8x8 diesel powered truck. It comes in cargo with light crane, cargo with medium crane, tanker, wrecker, and load handling system (LHS) versions. The HEMTT-LHS is an FY99 Warfighter Rapid Acquisition Program (WRAP) and a CSS enabler for Division XXI and the Transformation brigades. The HEMTT-LHS is funded in the HEMTT Extended Service Program

(ESP). Displaced cargo HEMTTs are converted to HEMTT-LHS. This precludes procuring a new truck for a new mission.

**Operational Requirement.** The HEMTT provides fuel and ammunition for combat, CS, and CSS units. The tractor is used to pull the PATRIOT launcher. The wrecker is used in various units for vehicle recovery. The HEMTT-LHS is a key CSS enabler for the Interim Brigade Combat Team (IBCT).

**Program Status.** The HEMTT is currently in production. First Unit Equipped (FUE) for HEMTT-LHS was October 2000. Additional wreckers are needed to fill shortfalls for Transformation requirements. HEMTT II will support the Future Combat System, and it will transition to the Future Tactical Truck System.

***Family of Medium Tactical Vehicles (FMTV)***

**Description.** The Family of Medium Tactical Vehicles is built around a common chassis and drive train, and featuring over 80% commonality of parts and components between models and weight classes. It provides state-of-the-art automotive technology and replaces all existing 2 ½ and 5-ton trucks in the Army inventory, including cargo, van, tractor, wrecker, and dump trucks, plus companion trailers in both weight classes.

**Operational Requirement.** FMTV is a key enabler for Army Transformation. It provides unit mobility, resupply, and transportation at all organizational levels. It operates worldwide in all weather and terrain conditions. It serves as the weapons system platform for HIMARS and the resupply vehicle for PATRIOT. FMTV enhances crew survivability through the use of hard cabs, three-point seat belts, central tire inflation, and run-flat capability. It provides enhanced tactical mobility and is strategically deployable in C5, C17, C130, and C141 aircraft. FMTV reduces the Army's logprint by providing commonality of parts and components, reduced maintenance downtime, and significantly lower operating and support costs than older trucks.

**Program Status.** FMTV is in full production. XVIII Airborne Corps was the FUE in January 1996. Over 13,600 FMTVs had been fielded as of 31 October 2001. A competitive multiyear rebuy contract is scheduled for award in March 2003. Fielding will continue through 2022 at current funding levels.

***Rough Terrain Container Handler (RTCH)***

**Description.** The RTCH is the materiel handling equipment with the capability to lift the standard 20- and 40-foot long ISO

family of 8-foot wide containers weighing up to 53,000 pounds while operating on beaches, rough terrain, and unimproved surfaces. The Army's supply system relies heavily on quickly delivering ISO containers through air, sea, and rail ports of debarkation to the battlefield. This RTCH must be air deployable and provide the flexibility to handle containers and prepositioned PLS flatracks, breakbulk cargo, and heavy palletized Class V loads when equipped with a forklift attachment.

**Operational Requirement.** The RTCH is the key enabler and pacing item for the Transportation Cargo Transfer Company (CTC). The CTC recently underwent a reorganization to convert all Active and Reserve Component units to an Improved Cargo Handling Operations (ICHO) design, which increases the requirement for RTCHs from 8 to 16 per unit. CTSs are critical enablers to project a CONUS base force into the theater of operations. They are essential to meet the Army goal of closing five divisions with support within 30 days. It is projected that 90% of general cargo and 95% or all ammunition will arrive containerized in the theater. The RTCH is the single most important item of MHE to provide the theater commander the ability to receive, stage, and discharge these containers. The RTCH is air transportable in C-5/C-17 in less than one hour.

**Program Status.** The RTCH is in full production. Fielding began in June 2001 with the activation of a new CTC at Fort Lewis to support the first IBCT.

## ***Maintenance Support Device (MSD) (Formerly the Soldier On-System Repair Tool (SPORT)***

**Description.** The MSD is a lightweight, ruggedized, portable tester employed at all levels of maintenance. It is the Army's standard on-system tester and is used by many different maintenance specialties to automatically diagnose weapon system operations, both electronic and automotive, and identify faulty components for immediate replacement. The MSD and its predecessor, the SPORT, are in wide use throughout the Army's ground combat and CSS vehicle fleets as well as in the Army aviation fleet.

**Operational Requirement.** The MSD is an essential maintenance tool in the support plans for the Army's ground vehicle and aviation fleets. It provides test and diagnostic support and maintenance automation capabilities that are critical to the readiness of Army units and their equipment. The MSD hosts interactive electronic technical manuals and expert diagnostic systems and is used to conduct intrusive testing in support of Army weapons and electronic systems. It also provides a means to upload/download mission-critical

software into weapon system on-board computer processors.

**Program Status.** The MILTOPE Corporation was recently awarded a five-year contract to develop the MSD. It is currently in full rate production and fielding. A recent change in the basis of issue will provide the MSD to organizational level maintainers at a ratio of 1:3 per maintainer MOS.

***Theater Support Vessel (TSV)***

**Description.** The TSV is a high-speed, 40+ knots sealift platform that will maximize commercial off-the-shelf (COTS) ferry technology currently in use in civilian markets. The TSV will support Intra Theater lift requirements and will eventually replace the current watercraft fleet as it reaches economic useful life span. Initial TSVs will meet the requirement for the last five LSVs (for a TAA 07 total requirement of 14 LSVs, of which only eight will be procured). The speed of the TSV will permit flexible stationing options while answering persistent, unresolved JWCA issue of late arrival of Army watercraft in Theaters.

**Operational Requirement.** The TSV replaces the current generation of Army watercraft to conduct Logistics Over-the-Shore (LOTS)/JLOTS and support responsiveness goals for Interim and Objective Forces.

**Program Status.** The ORD was approved 17 January 2000. Currently, one vehicle is being leased for testing purposes to refine and update the ORD.

***Medical Communications for Combat Casualty Care (MC4)***

**Description.** The MC4 system is a theater, automated Combat Health Support (CHS) system, which links commanders, health care providers, and medical support providers at all echelons with seamless, integrated medical information. It will receive, store, process, transmit, and report medical C2, medical surveillance, casualty movement/tracking, medical treatment, medical situational awareness, and medical logistics data across all levels of care. The MC4 is fully operational with standard Army systems and operates on standard Army hardware. MC4 is fully joint operations compatible and operates from a family of joint software. MC4 supports the commander with a streamlined personnel deployment system using digital medical information.

**Operational Requirement.** The MC4 system requirements are designed to provide the warfighter with the CHS digital tools necessary to support the Objective Force by enhancing their ability to project the force, protect the force, and sustain the force. Digital tools significantly

streamline the Soldier readiness process. Teleconsultation provides specialty medical information to maximize the effectiveness of deployed personnel. The MC4 system provides the real-time ability to monitor the medical status of an individual Soldier or unit. Automated medical logistics capabilities increase the effectiveness of theater medical supply by lowering stockpiles and reducing the medical footprint on the battlefield.

**Program Status.** MC4 is currently pre-Milestone B. The MC4 ORD has been approved by the Joint Requirements Oversight Council (JROC). The MC4 project timeline is closely tied to the Theater Medical Information Program (TMIP) whose Capstone Requirements Document and Block I ORD are both JROC approved.

## Focused Logistics Summary

The logistics modernization strategy focuses on developing, testing and evaluating, and procuring those systems that provide key support capabilities for Soldiers and weapon systems while reducing the logprint in the theater of operations and reducing costs without detracting from warfighting capabilities and readiness. This is essential to meet the requirements of the transformed force for the 21st Century. The implementation of this strategy requires a reduction in the number of vehicles, the leveraging of technology for reach-back capabilities, weapons and equipment designed in a systems approach, and advances in projection and sustainment. The key to achieving this is demand reduction. All ongoing CSS modernization initiatives will result in reduction in demand of some commodity or capability required on the battlefield.

The best trained Soldiers with the most technologically advanced weapons systems will always be reliant on a steady flow of ammunition, fuel, repair parts and services to keep both the Soldier and the equipment performing at their optimal levels. Logistics modernization will capitalize on the technologies, doctrine, and business practices that will enable that stream of supplies and services to flow in a more efficient and effective manner. The end result of this effort will be a logistics force with the same agility and deployability as the combat forces that it supports.

# Information Superiority

## General

Information Superiority (IS) is the cornerstone of Army Transformation that provides Army Commanders an overwhelming competitive advantage throughout the electronic spectrum on current and future battlefields. This competitive advantage is accomplished through the use of our command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) systems to ensure the Army will dominate any battlefield through the full spectrum of military operations.

IS ensures the translation of raw information into superior knowledge through the integration of a network-based C4ISR and target acquisition systems-of-systems, enabling combat commanders to make and implement superior decisions more rapidly than their opposition. The Army Legacy, Interim, and Objective Forces will use the resulting superior information to achieve dominant maneuver, precision engagement, full dimensional protection, and focused logistics through the full spectrum of military operations, ensuring combat overmatch against any potential adversary, now and in the future.

In order to create an effective Objective Force, the Army must ensure the adequate investment of critical resources to develop and field advanced C4ISR systems. Without Information Superiority, the Army's current and future combat systems lose much of their competitive edge on the modern battlefield. The Army must balance cost effective modernization efforts with maintaining essential readiness of the current and interim force. Information Superiority is expensive, yet highly cost effective when dominating the modern battlefield and saving Soldiers' lives.

Although the Army considers Information Superiority to be an integrated capability, it is through the modernization of individual systems and programs that this capability is acquired. Fielding of modernized information systems is then implemented in accordance with Unit Set Fielding and Software Blocking guidelines. Adherence to these guidelines ensures that Information Superiority capabilities are fully interoperable between battlefield functional areas. The two primary Army functional areas that support the achievement of Information Superiority on the battlefield are Command, Control and Signal; and Intelligence and Electronic Warfare (IEW). Other functional areas that contribute key components to Information Superiority are Fire Support, Air Defense, Engineers, and Logistics.

Investment in Information Superiority will ensure the Army will be fully capable of winning our Nation's wars decisively and protecting our vital national interests in any environment in the world.

# Command, Control, and Signal Systems

## Overview

The Command, Control and Signal Systems provide Army Commanders the ability to fight and win our nations wars. These systems ensure the Army can prepare plans, execute operations, and share critical information through inter-netted communications capability within the Army and joint/coalition forces. These systems provide our tactical elements with transparent connectivity for voice, data, and video teleconference and communications systems throughout the operational spectrum.

Army modernization must ensure the synchronization of communications related efforts and a modernization strategy toward achieving IS across the full spectrum of potential missions—now and in the future. It protects the research, development, and procurement of key information systems and services for ensuring IS that supports the Army's Transformation efforts. In a capabilities-based force, IS is measured by the ability to make informed decisions faster, control forces more effectively and to sustain operations longer and faster than your opponent. The Army must fund appropriate levels of Command and Control and Signal systems to ensure the effective transformation toward the Objective Force. These systems must continue to be developed to be more deployable and lighter in supporting a smaller and more combat-effective force.

## Command, Control, and Signal Systems Modernization in Support of Transformation

Command, Control, and Signal Systems enable seamless, protected, survivable, integrated, and dynamic information services to the warfighter for achieving Information Superiority across the full spectrum of operations. These information technology systems provide the capability for getting relevant information to the right place at the right time on the modern battlefield.

Modernizing our Army to be an agile, lighter, and more deployable force capable of maintaining IS will require funding a robust Command, Control, Communications, and Computers (C4) architecture specifically designed to meet the dramatically increasing information and data requirements of the modernized force. Achieving IS in the 1st Cavalry Division, the Counterattack Corps (III Corps), the Interim Brigade Combat Teams (IBCTs), and Army Special Operation Forces (ARSOF) units remain a top Army priority. A broad overview of some key programs and their relationship to our modernization goals are discussed in the following paragraphs.

The Army Battle Command System (ABCS) concept provides for the overall integration of digital C2 systems found at all echelons from theater level to the weapons platforms. The components that fuse and display the common picture are the Global Command and Control System–Army (GCCS-A), Maneuver Control System (MCS), and the Force XXI Battle Command Brigade and Below System (FBCB2). Additionally, the

linkage of these C2 systems (via the Tactical Operations Centers (TOCs) and Standardized Integrated Command Post System (SICPS) programs provides our tactical forces with a functional C2 suite that significantly reduces the logistical footprint. Currently, MCS and FBCB2 are being equipped to IBCTs and III Corps units, to include appropriate Reserve Component (RC) units at echelons above division. We must continue our S&T investment to improve their capabilities and transition into the Objective Force.

The terrestrial and switching backbone of our communications infrastructure network represents our single greatest deficiency in transforming from our Legacy Force. The Army Common User System (ACUS) modernization program recapitalizes our existing Mobile Subscriber Equipment (MSE) and Tri-Service Tactical Communications (TRI-TAC) switching network systems for the known requirement of today's forces. At the lower level, the Tactical Internet (TI) comprises the communications infrastructure for the transfer of information across the battlefield. The Enhanced Position Location Reporting System (EPLRS) and Single Channel Ground and Airborne Radio System (SINCGARS) are currently the communications systems of the TI. With the ever-increasing voice and data requirements, this emerged as another area requiring improvement to maintain IS and applicability into the future.

To extend the communications links beyond line-of-sight (BLOS) and obtain the critical reachback capability, the Army will rely on satellite communications (both government owned and commercial lease). Our current Defense Satellite Communications System (DSCS) ground terminals (AN/TSC-85s and AN/TSC-93s) are antiquated and do not meet the deployability requirement of a transforming Force (Interim or Objective). Due to the critical importance of space-based communications, these legacy systems are being replaced by the Secure Mobile Anti-Jam Reliable Tactical Terminal (SMART-T), and the Super High Frequency (SHF) Tri-Band Advanced Range Extension Terminal (STAR-T). The SMART-T and STAR-T will provide immediate improvements to our Legacy and Interim Forces. Additionally, we have a long-term investment in the Single Channel Anti-Jam Manportable (SCAMP) manpack terminal and the Global Broadcast Service (GBS). Focused and consistent investments in Science and Technology (S&T) that exploit technological development are the centerpiece for maintaining IS, which is crucial to our Modernization Program.

As we prepare for the Objective Force, our research and development (R&D) efforts must transform vast amounts of data into usable information and knowledge for the warfighter. Our network architectures and technical standards will continue to evolve. With the growing requirement for information and a more responsive force, the Warfighter Information Network-Tactical (WIN-T) will increase the security, capacity, and speed of information distribution; support split-based operations; and increase mobility with a smaller logistical footprint. In concert with the other Services, the Joint Tactical Radio System (JTRS) will become the Army's primary tactical radio for mobile communications. This lightweight, multiband radio will provide embedded voice, data, and video

teleconference capability. Additionally, it will replace multiple legacy radio systems within the Army's inventory and will be a key component of the TI. The future Multiband Integrated Satellite Terminal (MIST) will replace the STAR-T and SMART-T to provide the warfighter with BLOS and reachback communications.

**Discussion of Key Equipment**

***Warfighter Information Network-Tactical (WIN-T)***

**Description.** WIN-T is the next generation terrestrial communications and information system, which currently consisting of TRI-TAC and the MSE systems. WIN-T provides simultaneous voice, data, and video services.

**Operational Requirement.** WIN-T is the Army's objective tactical digital communications network that will provide tactical networking for the deployed warfighter.

**Program Status.** WIN-T will go through a source selection evaluation board in FY02, award two contracts to define a detailed system architecture. Upon successful passing of its milestone B decision, the program will continue through its System Integration Phase of development. A milestone C decision is projected for FY07 with a full rate production awarded planned for FY08.

***Army Common User System (ACUS) Modernization Program [Mobile Subscriber Equipment (MSE) and Tri-Service Tactical Communications (TRI-TAC)]***

**Description.** ACUS is the terrestrial communications and information system that currently consists of the TRI-TAC and MSE systems. Upgrades to the systems provide an increased capability to support voice, data, and video requirements in one of two ways—Tactical High Speed Data Network (THSDN) and technology insertion. The ACUS modernization efforts will support the Army's Transformation initiatives by inserting new technologies (Brigade Subscriber Node (BSN), battlefield videoteleconferencing, wireless LAN, and Network Operations Center vehicles (NOC-V)) into the Army's IBCTs.

**Operational Requirement.** ACUS modernization provides mobile, secure, survivable, seamless multimedia connectivity between all elements within the battlespace.

**Program Status.** The ACUS Technology Insertion is on track for fielding completion to the Counterattack Corps by 2004. Additionally, THSDN fielding to the remainder of the force was initiated in FY00 with completion anticipated in FY03.

***Joint Tactical Radio System (JTRS)***

**Description.** JTRS will provide a family of affordable, high-capacity, modular

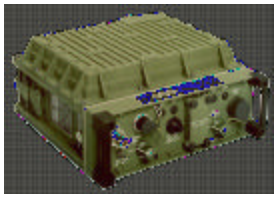
communications systems for line-of-sight (LOS) and BLOS command, control, communications, computers, and intelligence (C4I) capabilities for the warfighter. This system is being designed as a secure, multiband, multimode, software reprogrammable, digital communications system that will support the broad range of C4I requirements.

**Operational Requirement.** The system will maintain interoperability with legacy systems while advancing to future wireless communications technologies.

**Program Status.** The JTRS is currently within its system development and demonstration phase. Milestone C is scheduled for FY05, Operational Test and Evaluation is scheduled for FY06 and full rate production is planned for FY07.

## ***Enhanced Position Location Reporting System (EPLRS)***

**Description**. EPLRS provides automated, secure, near real-time data communications and Position/Navigation (POS/NAV) services for the digitized force. EPLRS consists of a Network Control Station (NCS) and radio sets with embedded communications Security (COMSEC), which can be configured as vehicular, manpack and airborne units.



**Operational Requirement.** EPLRS provides commanders with highly reliable, automated, secure, near-real-time data communications and POS/NAV services as the digital data backbone of Force XXI Battle Command Brigade and Below (FBCB2) and Battlefield Functional Areas (BFA). EPLRS, in conjunction with FBCB2, will provide the majority of the Army's input to the Common Tactical Picture (CTP) and the Common Operational Picture (COP).

**Program Status.** The Army will procure and field EPLRS to the Counterattack Corps, Force Package 1, and other high-priority users. Current EPLRS Army Procurement Objective (APO) is 12,896. Approximately 2,676 radios have been fielded.

## ***Single Channel Ground and Airborne Radio System (SINCGARS)***

**Description.** SINCGARS provides commanders with a highly reliable, secure, easily maintained Combat Net Radio (CNR) that has both voice and data handling capability in support of C2 operations. SINCGARS, with the Internet controller, provides the communications link for the digitized force. The Advanced System Improvement Program (ASIP) models are of a reduced size and weight, providing further enhancements to operational capability in the TI environment.

**Operational Requirement.** SINCGARS will provide a highly reliable, secure,

easily maintained CNR that has both voice and data handling capability.

**Program Status.** A production delivery order will be awarded in 3QFY01 to procure Congressionally-directed assets for the ARNG and IBCTs. Approximately 229,778 radios have been fielded.

***Defense Satellite Communications System (DSCS)***

**Description.**

DSCS provides super high frequency (SHF) wideband satellite communications supporting critical national strategic and tactical Command, Control, Communications, and Intelligence (C3I) requirements. DSCS supports the Army warfighter as well as Department of Defense (DoD) and non-DoD users, as approved by the Joint Staff/Commanders-in-Chief (CINCs) or by the Secretary of Defense (SECDEF). DSCS terminals are designed to operate with the DSCS and NATO satellites and to maintain the warfighter's ability to communicate back to the sustaining base during war and contingency operations.

**Operational Requirement.** DSCS provides high-capacity, inter- and intra-theater range extension support to Army and joint warfighters from Corps level and higher. The system is used at all levels of command from the National Command Authorities (NCA) to the tactical theater. The DSCS earth terminal's direct interface with SHF Tri-Band Advanced Range Extension Terminal (STAR-T) is the warfighter's primary means of reachback communications in all levels of conflict.

**Program Status.** DSCS terminals and control centers are undergoing a modernization effort (selected upgrade).

***Secure Multichannel Anti-Jam Reliable Terminal-Tactical (SMART-T)***

**Description.**

SMART-T is a transportable, tactical, satellite communications terminal that operates with the current MILSTAR satellite low data rate (LDR) (up to 2.4kbps) and medium data rate (MDR) (up to 1.544mbps) extremely high frequency (EHF) communications payload and the future advanced EHF (AEHF) constellation.

**Operational Requirement.** SMART-T provides protected communications for the in-theater range extension of the Army's MSE at echelons corps and below.

**Program Status.** The SMART-T has completed its Follow-on Test and Evaluation and is expected to begin full rate production of terminals in FY02. Fielding will continue through FY07.

***SHF Tri-Band Advanced Range Extension Terminal (STAR-T)***

**Description.** STAR-T is a super high frequency (SHF) multiband multichannel satellite terminal. STAR-T is a self-contained, one vehicle communications

package capable of operating over commercial and military SHF satellites, and interfaces with commercial and military switching systems.

**Operational Requirement.** STAR-T will provide high capacity inter- and intra-theater range extension support at echelons above corps (EAC) and selected corps signal units. STAR-T will be the warfighter's primary means of reachback communications. STAR-T will ultimately replace aging ground mobile force satellite terminals (AN/TSC-85s/93s).

**Program Status.** STAR-T is currently in system development. In FY01, the Government terminated the contract with the initial vendor. The requirements remain valid, and the Army is executing a new strategy to meet the expeditiously meet the requirements in the most cost-effective manner.

## ***Force XXI Battle Command Brigade and Below System (FBCB2)***

**Description.** FBCB2, mounted on a variety of platforms, provides situational awareness and C2 functionality to the warfighter. The system consists of FBCB2 hardware and/or software integrated into the various platforms at brigade and below, as well as appropriate division and corps slices (including RC elements supporting the Counterattack Corps) necessary to support brigade operations. The FBCB2 hardware consists of a computer employing commercial-off-the-shelf components in a ruggedized central processing unit case, display, and keyboard. FBCB2 integrates emerging and existing communications, weapon, and sensor systems on a single display. It interfaces with the Army Tactical Command and Control System (ATCCS) at brigade and battalion levels across all BFAs. FBCB2 is a subelement and key component of the ABCS.

**Operational Requirement.** FBCB2 is a joint interoperable, digital, battle command information system for brigade level and below commanders. It is designed to provide dismounted/mounted combat elements with near-real-time, integrated situational awareness information and C2 functionality. FBCB2 will enhance the ability of tactical commanders to better synchronize their forces, achieve agility, and gain a “feel” of the battlespace through improved situational awareness and better combat awareness reporting while on the move.

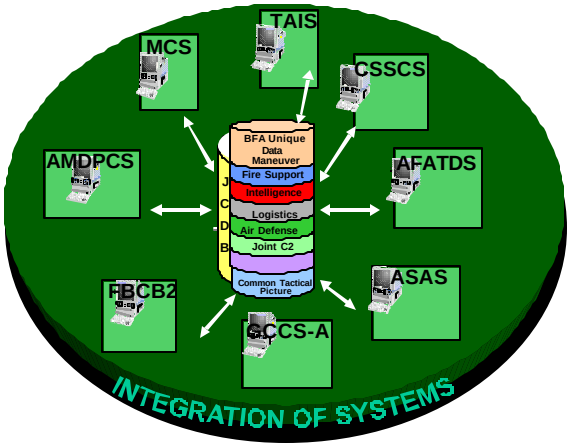
**Program Status.** FBCB2 is currently preparing for an Initial Operational Test and Evaluation in FY03. EMD models have been fielded to 4th Infantry Division and IBCTs will begin fielding this year.

## ***Army Battle Command System (ABCS)***

**Description.** ABCS is the Army’s component of the Global Command and Control System (GCCS). It is a complex system of systems that provides the mechanism to receive and transmit information among the joint forces. ABCS consists of subsystem software that

provides specific support for the Battlefield Functional Areas, including the Maneuver Control System (MCS), All Source Analysis System (ASAS), Advanced Field Artillery Tactical Data System (AFATDS), Air and Missile Defense Planning and Control System (AMDPCS), Global Command and Control System-Army (GCCS-A), Combat Service Support Control System (CSSCS) and the Force XXI Battle Command Brigade and Below System (FBCB2). Additionally, common software products enable information sharing with other systems and provide situational awareness of the battlefield to every echelon. By integrating the ABCS components through common software products such as the Joint Common Database (JCDB), the common tactical picture can be viewed at any workstation and within the operator's specific requirements.

**Army Battle Command System**




**Operational Requirement.** Each of the ABCS subsystems and associated programs are essential to the digitization of the total force. The objective of ABCS is increased lethality, survivability, operational tempo (OPTEMPO), and sustainability through information dominance, battlefield visualization, and situational awareness.

**Program Status.** The Army will continue to fund ABCS integration to support digitization of III Corps, IBCTs, and other high-priority users.

## ***Maneuver Control System (MCS)***

**Description.** MCS is an automated C2 system that provides a network of computer terminals to process combat information for battle staffs. It provides automated assistance in the collection, storage, review, and display of information to support the commander's decision process. Both text and map graphics are provided to the user.

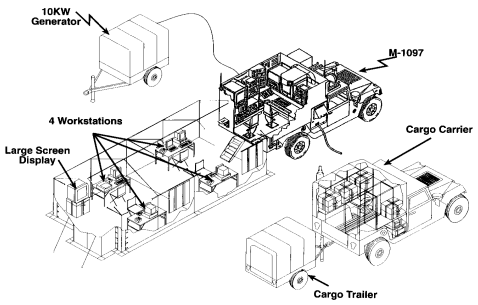
**Operational Requirement.** MCS provides an integrated picture of Fire Support, Air Defense, Intelligence and Electronic Warfare, and Combat Service Support to produce a common picture of the battlefield. It provides critical, time-sensitive information to shorten the decision-cycle process. MCS provides an automated, on-line, near-real-time capability for planning, coordinating, monitoring, and controlling tactical

operations. It is the force-level commander's information system.

**Program Status.** The MCS Block IV Program is in the Engineering and Manufacturing Development (EMD) phase scheduled for an Initial Operational Test and Evaluation (IOT&E) in FY03.

***Integrated System Control System (ISYSCON)***

AN/TYQ-76A(V)2 ISYSCON




TSC(A), EAC AND CORPS SIG BDE AND DIVISION SIG BN

**Description.** ISYSCON provides an automated, theater-wide system to manage multiple tactical communications systems in support of battlefield operations. Additionally, ISYSCON interfaces with each BFA in the ABCS.

**Operational Requirement.** ISYSCON will provide centralized control of the data networks that interconnect all C2 systems and all weapon systems on the battlefield.

**Program Status.** The fielding of network management for III Corps elements is on track for 2004.

## Command, Control (C2) and Signal Systems Summary

Warfighting commanders require effective Command, Control and Signal Systems to fight and win our nations wars. In order to dominate the current and future battlefields, we must continue to invest wisely in future systems supporting the Objective Force, as well as continue our support our current and interim systems. We must continue the maintenance, selected upgrades, and modernization of our legacy systems. In most cases, these systems will transition to the Objective Force. Through balanced and realistic funding support, we will continue to support our current ability to command and control our forces, while developing technological solutions that will allow us to dominate the future battlefields.

C2 and Signal Systems are absolutely critical to the success of the objective force. While the priority is our Objective Force, our Interim Brigade Combat Teams and selected legacy force will also receive priority support. The key is to ensure the level of funding of our Information Superiority infrastructure is consistent with the combat systems it supports. This will ensure that Command, Control and Signal Systems will continue to serve as the cornerstone of our interoperable combat force for Army, joint and combined operations throughout the world.

# Intelligence and Electronic Warfare (IEW)

## Overview

Army IEW for today's Legacy and Interim Forces continues to be fully equipped to operate in the information dimension as a key member of the Army Team within Joint and coalition force environments. Army Airborne Reconnaissance Low

(ARL) and Guardrail/Common Sensor (GR/CS) platforms support indication and warning operations in Korea, counter-drug missions in SOUTHCOM, and Joint Chiefs of Staff collection missions in other theaters. Counter-Intelligence/Human Intelligence (CI/HUMINT) Information Management System (CHIMS) and All-Source Analysis System (ASAS) are employed extensively for force protection throughout the Balkans. Integrated Meteorological System (IMETS) is deployed throughout the force to provide weather effects information. IEW systems are actively employed in the air and on the ground in support of Homeland Defense and combat operations in the current war against terrorism, enabling commanders to assess and mitigate risk from an incredibly complex and diverse spectrum of threats.

## IEW Modernization in Support of Transformation

The fundamental mission for Intelligence, whether today or in the Objective Force, remains satisfying the commander's need for unambiguous, concise, accurate, and timely threat information. In the Objective Force, this mission will need to be conducted more rapidly and with greater fidelity, while operating in a strategic and operational environment that requires the rapid deployment of CONUS-based forces in response to crises.

Army intelligence in the Objective Force must operate within a national, Joint, and combined environment and will leverage the capabilities and expertise of the U.S. national intelligence community, allies, academia, media, and industry in order to provide commanders focused, near-certain knowledge, ensuring the commander's dominant understanding at the point of decision. This knowledge will be presented using the collaborative, analytical, and communications power of modern information technology.

For Army IEW, this mandates a fundamental change in our current approach to providing intelligence. The existing architecture of multiple ground processing systems, each aligned with either a specific intelligence discipline or a specific sensor, is no longer operationally or economically viable. While each of the current systems addresses a validated need, when viewed collectively as a comprehensive architecture or system they are too heavy to deploy rapidly and do not achieve the requisite integrated solution needed to achieve information dominance for the Objective Force commander on future battlefields. Objective Force IEW systems must be capable of distributed and collaborative reach operations with reduced footprint forward.

IEW modernization is therefore focused on migration of our current systems toward an interoperable network-centric construct with fewer, but more capable, sensors and processors. This reduction in the number of separate platforms will increase strategic deployability and tactical mobility, while decreasing in-theater footprint. However, even with a decreased presence in-theater, the fluid nature of ground combat dictates that some intelligence capabilities will always remain forward in order to provide dedicated near-real-time combat intelligence to the Objective Force commander in the close fight.

Today's intensive levels of global employment for Army forces, particularly in the aftermath of 11 September and the war on terrorism, requires robust IEW capabilities be maintained, and in some cases upgraded, for the Legacy and Interim Forces.

**Modernization Priorities**

The top priority for IEW modernization is the migration of our current "stove-piped" intelligence processors to the Distributed Common Ground System - Army (DCGS-A). DCGS-A is a modular and scaleable family of multi-intelligence tasking, processing, exploitation, and dissemination (TPED) systems that will replace all current and future Army intelligence processing systems for national, Joint, and Army organic sensor data. DCGS-A will provide unambiguous intelligence information and targeting information and is a critical system for Transformation.

DCGS-A will be integrated with the All Source Analysis System (ASAS) intelligence fusion system, which provides automated intelligence analysis, battlefield visualization, management of IEW resources, and production and dissemination of intelligence to warfighting commanders and staffs. Components of DCGS-A and ASAS will be fielded to all echelons in the Army from theater down to battalion, enabling the rapid dissemination of the all source fusion picture of the current threat to forward combat maneuver commanders. ASAS is the IEW interface to the warfighting Army Battle Command System (ABCS) and to the Joint Global Command and Control System (GCCS).

Aerial Common Sensor (ACS) is the Army's next-generation airborne ISR collection platform, and is the next highest IEW modernization priority. ACS is the only purely Objective Force IEW system and is in the early stages of component advanced development. It will replace two legacy airborne ISR systems, and will begin fielding in FY09 in order to meet the timeline for the Objective Force. ACS will be a multi-intelligence collection system, and will provide responsive precision targeting data to the full range of Army organic weapon systems in support of the Joint Task Force or ground component commander. Airborne Reconnaissance Low (ARL), the Army's current premier multi-intelligence airborne ISR platform will serve as an operational test bed for ACS capability development.

Following close behind ACS in priority is the Army's Tactical Unmanned Aerial Vehicle (TUAV) program. TUAV provides dedicated and responsive surveillance and targeting information to the maneuver brigade, giving the tactical commander the ability to physically look over the next hill for the first time in the history of the US Army. The development of advanced sensors and extended range and loiter time will enhance the ability of UAVs to provide enhanced situation awareness and real-time targeting information for precision fires.

Prophet is the Army's Legacy-to-Objective ground SIGINT and MASINT sensor and Electronic Attack (EA) system. Prophet will replace four currently fielded legacy systems, while reducing footprint, manpower, and logistics tail. The objective system will provide enhanced situation awareness, battlespace visualization, target

development, and force protection in the division, brigade, and armored cavalry regiment areas of operation. Prophet will be capable of conducting both collection and EA on the move, enabling it to operate in close support to highly mobile combat maneuver forces throughout the full-spectrum of operations.

**Discussion of Key Equipment**

***Distributed Common Ground System –Army (DCGS-A)***

**Description**. DCGS-A is a family of systems and an integral component of the Army's intelligence, surveillance, and reconnaissance (ISR) networking strategy. DCGS-A will migrate disparate ISR systems into a joint common and interoperable multi-intelligence architecture to improve the ground commander's ability to react within the enemy's decision cycle. DCGS-A nodes located at each Army and joint echelon will task, process, exploit, and disseminate Army, joint, national, and coalition ISR sensor data and information in support of Objective Force and Joint Task Force operations. Operating in a secure collaborative, networked environment, DCGS-A products will be made available in near real-time via the Analysis and Control Element (ACE) and the All Source Analysis System (ASAS).

**Operational Requirement**. DCGS-A will allow the Army user to receive sensor data from available sensors, regardless of Service affiliation. Conversely, through the joint DCGS architecture (via DCGS-A or direct from the Army sensors), other Services will have access to Army sensor data and products. DCGS-A will provide robust single source/ multi-intelligence data to the ACE for improved development of Intelligence Preparation of Battlespace, Offensive Courses of Action, Battle Damage Assessments Indications and Warnings and dissemination of these products to the warfighter.

**Program Status**. Army ISR processors including the Tactical Exploitation System (TES), Guardrail Common Sensor Information Node (GRIFN), Common Ground Station (CGS), Counterintelligence and Human Intelligence Workstation (CI & HUMINT WS), and the Unmanned Aerial Vehicle Ground Control Station/Tactical Control System (UAV GCS/TCS), will migrate into the common DCGS-A architecture. The DCGS-A program will employ a blocked-approach development and acquisition strategy to develop, demonstrate, and field improved system capabilities culminating with an objective capability fielding in FY08. The XVIII Airborne Corps will demonstrate a DCGS-A interim capability in FY03 and a multi-echelon DCGS-A capability will be fielded to III Corps in FY04.

***The All Source Analysis System (ASAS)***

**Description.** ASAS is comprised of three major components: the Analysis and

Control Element (ACE), the Remote Workstation (RWS), and the Analysis and Control Team-Enclave (ACT-E). The ASAS ACE is the intelligence analyst's primary tool for fusing intelligence collected from multiple sources and then passes the correlated enemy picture to the commander and his staff. It disseminates the fused intelligence picture to the warfighter via the Army Battle Command System Local Area Net (ABCS LAN). It is located at the Corps/Division operations centers, EAC intelligence centers, and at Army staffs throughout a theater/joint command. The RWS is the warfighter's primary collateral intelligence source that also facilitates intelligence preparation of the battlefield (IPB), situation analysis, collection planning, and high-value target nomination. It operates primarily in a collateral environment down to the brigade level. A laptop version, ASAS-Light, operates and provides the fused intelligence at the battalion level. The maneuver brigade commander is also provided additional intelligence support via the ACT-E, a vehicle-mounted shelter containing two RWSs with integrated communications and LAN access capability. The ACT-E provides the commander a mobile, self-contained, rapidly deployable intelligence processing capability at the brigade and brigade forward.

**Operational Requirement.** ASAS is the IEW component of ABCS supporting the warfighter from theater to battalion. ASAS provides commanders with enemy situation awareness, targeting, ISR management, collaboration, non-structured threat analysis, predictive analysis, and force protection. In a networked environment, it automates IEW collection/mission management, high-value target nomination, IPB, and fuses inputs from multiple intelligence sources to develop the threat picture and "gray" environment (non-governmental organization, refugees, etc.) for the commander's overall situational awareness. This results in a timely, accurate, and common relevant enemy picture throughout all echelons on the battlefield.

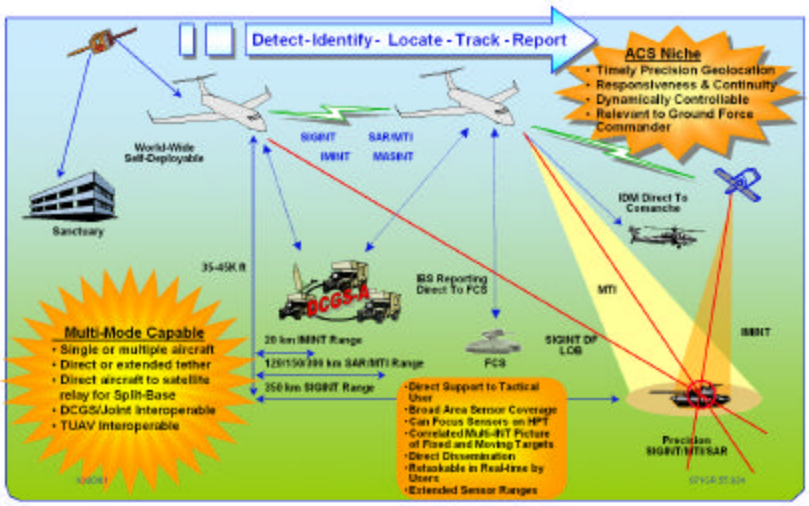
**Program Status.** ASAS Block II is in EMD with several components in full rate production. The RWS, ACT-E, and ASAS-Light have completed operational testing, and fielding began in FY99, FY00, and FY01, respectively. The ASAS ACE will complete operational test in FY03, with fielding to start in FY04. The ASAS Block III development will start in FY04.

## ***Aerial Common Sensor (ACS)***

**Description.** ACS is a critical Objective Force system that satisfies the Army's requirement for a worldwide, self-deployable airborne ISR asset that can begin operations upon arrival into theater. The wide area surveillance, precision targeting, and use of the DCGS-A for the ground station component makes ACS relevant throughout the entire spectrum of operations. ACS will provide commanders at every echelon the tailored, multi-sensor intelligence required for mission success. The air platform has not been selected; however, sensor payloads include COMINT, ELINT, IMINT, and MASINT, such as, EO, IR, SAR, MTI, multi- and hyperspectral imagery sensors.

**Operational Requirement.** ACS is the objective airborne multidiscipline intelligence platform for corps and EAC

military intelligence brigades. ACS will merge the capabilities of GRCS and ARL into a multifunctional system (SIGINT, IMINT and MASINT). ACS will provide the precision-targeting data needed by future deep-strike weapon systems and the Objective Force. ACS will support early-entry operations and forward-deployed forces by providing timely indications and warning, dominant situational awareness, battle management, and precision targeting capabilities across the full spectrum of operations.




**Program Status.** An Analysis of Alternatives was completed in FY01. ACS is currently transitioning from the concept exploration phase to the component advanced development phase (CAD). Milestone B is scheduled for 4QFY03. IOT&E and Milestone C are scheduled for FY08**.** FUE is scheduled for FY09 in order to meet timelines for IOC of the initial Objective Force unit.

## ***The Tactical Unmanned Aerial Vehicle (TUAV)***

**Description.** Each Shadow 200 TUAV system consists of three Shadow 200 air

vehicles, two Ground Control Stations (GCS), one portable GCS, and four remote video terminals that can provide near-real-time video to commanders on the ground. The Shadow 200 TUAVs currently have an on-board electro-optic (EO)/infrared (IR) sensor payload. Objective payloads will include advanced EO/IR, all-weather synthetic aperture radar (SAR) and moving target indicator (MTI), and signals intelligence (SIGINT) sensors. The threshold range is 50km with an objective range of 200km and an on-station endurance of four hours. The threshold payload is 60lbs with an objective capacity of 100lbs. OPTEMPO requirements a threshold of 12 per 24-hours and an objective of 18 per 24 hours.

**Operational Requirement.** The Shadow 200 TUAV is the ground maneuver commander's primary day/night Reconnaissance, Surveillance, and Target Acquisition (RSTA) system. It provides the commander with enhanced situational awareness, target acquisition, battle damage assessment, and enhanced battle management capabilities.

**Program Status.** An EMD contract was awarded in December 1999 with four systems delivered to support testing and Initial Operational Test and Evaluation in FY01. An LRIP contract awarded in Mar 01 will deliver four systems between November 2001 through December 2002. Several unrelated incidents with the system in Apr/May 01 caused IOT&E to slip by one year. In December 2001, the Army will decide whether to pursue a second LRIP purchase of six systems. First unit equipped will be declared for 1st Brigade, 4th Infantry Division after IOT&E is complete in April 2002. The Initial Operational Capability will be declared upon fielding of the third system, which will be in August 2020. The Army Acquisition Objective is 83 systems. Current funding provides for 60 systems.

***Prophet***

**Description.** Prophet provides expanded frequency and area SIGINT coverage of the battlefield for situational development and awareness and force protection operations. Prophet will support on-the-move and dismounted operations. Programmed block improvements include electronic attack, advanced signals, and MASINT capabilities. Prophet replaces four more costly legacy systems. Prophet gives the commander a dedicated, dynamically retaskable asset. Prophet allows the tactical commander to visually depict and understand his battlespace and gain situational awareness on the battlefield of the future. An Engineering, Manufacturing, and Developmental (EMD) version of Prophet was successfully employed in support of Operation ENDURING FREEDOM, demonstrating the utility of using a highly mobile ground sensor system for enhanced situational awareness and force protection.

**Operational Requirement.** Prophet provides actionable intelligence (SIGINT/MASINT), in support of IBCT and brigade commanders throughout the entire spectrum of operations. It gives the commander a comprehensive picture of electronic emitters in his battlespace and provides the ability to collect, locate, and electronically attack selected emitters.

**Program Status.** Prophet Block I passed IOT&E in December FY00, completed Milestone III in March FY01, and has entered FRP, with initial fielding scheduled for Sep 2002. The Prophet Air program has been restructured as the Division TUAV SIGINT Payload (DTSP). DTSP will provide enhanced situational awareness to the division commander by electronic mapping of threat emitters. DTSP is currently in the Concept Exploration Phase with an expected FUE of FY09.

## IEW Summary

The Army is developing a knowledge-centric warfighting concept. Commanders have always wanted to base their decisions on near-perfect knowledge, but rarely was such knowledge immediately available forward at the point of decision. In the past, the lack of perfect knowledge was compensated for by mass, technology,

sufficient armor to survive meeting engagements, and detailed knowledge about our opponents' operational and tactical patterns. The transcendent need for speed of action, rapid deployability and full spectrum dominance mandates a transformed Army that stakes its success on dominant understanding of the battlespace, gained through dominant knowledge. Superior intelligence, surveillance, and reconnaissance (ISR), Electronic Warfare (EW) and cutting edge Information Operations (IO) are integral to achieving that dominant knowledge in the Objective Force.

IEW supports the Army's Transformation strategy by integrating national, joint, theater, and other Service intelligence systems into a seamless system-of-systems to enable combat overmatch in the near term, while developing capabilities for the Objective Force that will provide near-perfect intelligence and dominant knowledge at the point of decision. Selected upgrades are being applied to legacy systems in order to maintain technical relevancy, particularly in light of the current war against terrorism, but IEW modernization priorities remains focused on systems that will support the Objective Force.

# Annex B: Doctrine

## Concepts to Doctrine

The Army's Training and Doctrine Command (TRADOC) Objective Force Concept is the capstone warfighting concept that provides a holistic, macro-level description of the future Army and how it will conduct future operations. It is the foundation for a comprehensive Objective Force body of work, which includes detailed subordinate concepts that describe the full range of interdependent operations, functions, and related future Army capabilities from a variety of perspectives and levels. The capstone concept describes future Army capabilities and the impact these capabilities have on the entire force. It describes capabilities for global power projection and employment of U.S. forces across the full spectrum of military operations conducted at strategic, operational, and tactical levels in joint, multinational and interagency operations. The development of the concept begins with the study and analyses of a wide range of data to include, Army missions, historical perspectives, operational environments, technological forecasts, assumptions and current Army doctrine.

*Joint Vision 2020* and the Army Vision are key documents in the logic trail from concepts to doctrine. As a new concept begins to mature it is analyzed in relationship to doctrine, training, leader development, organization, materiel, and Soldier systems (DTLOMS). Future operational capabilities and force design parameters are identified that are required for maneuver, maneuver support, and maneuver sustainment functions on the battlefield. These documents provide focus for the experimentation programs and science and technology. Once an initial draft of a concept is complete it is analyzed through process of experimentation and testing. This analysis may take place in several forms to include studies by the TRADOC Analysis Center, analysis at the Army Battle Labs or in a series of wargames. Results are integrated back into the process to produce a second draft. If approved, a concept would be published as a series 525-manual. Approved concepts move into the Army doctrine cycle to become an Army Field Manual (FM). FM-1, *The Army* and FM-3, *Operations* describe how the Army would prosecute the range of operations.

Concepts drive doctrine, which in turn becomes a key ingredient in the combat readiness of the Army. With approved doctrine in hand the Army can insure that leader, individual, and collective training are all oriented toward producing an Army with a common operational mindset, operational language and common tactics, techniques, and procedures.

## Doctrine Process

The Army's future doctrine must enable core warfighting capabilities while increasing its strategic responsiveness and dominance over an expanded range of mission environments and threats. Our doctrine must account for the inherent risks of Soldiering, while encouraging the relentless pursuit of the initiative in all military operations. It must fully address the importance a common picture of the

battlefield plays in joint simultaneous engagement in depth, shaping the close fight and winning with overmatch. Doctrine must fully address how to effectively integrate and balance the application of information-enabled precision effects and maneuver into every mission area along the operational spectrum. Firepower not only destroys, its effects psychologically suppress Soldiers and disrupts their formations. It also accounts for the rapid arrival of troops on the ground to take control of a local situation before the transitory effects of firepower pass, enabling the exploitation of those effects.

Doctrine must also account for the fact that the Army will be a hybrid force, with current organizations, training systems, and materiel being replaced over time. It must also emphasize the distributed, noncontiguous operations required in *JV 2020*. It must address the complete range of potential tactical and operational missions and operating environments—not only open rolling terrain but also close terrain and the equally challenging complex and urban terrain that is becoming the battlefield of choice for potential adversaries. Most importantly, this doctrine must be comprehensive and embrace the full spectrum of military operations, providing a conceptual basis for the rapid transition—without loss of momentum—across the spectrum of operations.

In the near-term, TRADOC will conduct an integrated re-write of key Army concepts, doctrine, and strategic plans to address full spectrum operations in the joint, interagency, and multinational environment. TRADOC will focus on doctrine and warfighting concepts that enable joint synergy to maximize lethality and survivability. Joint capabilities for precision maneuver and engagement, particularly the engagement of moving ground targets, will demand concepts and associated capabilities for joint, real-time, fully integrated sensor-to-shooter links and exponential advances in the Army's precision engagement capabilities.

TRADOC must also anticipate future Army doctrine that is nested within, rather than simply compatible with, joint doctrine. These efforts to shape Army doctrine will continue throughout the mid and far term. By the mid-term, TRADOC will reform our doctrinal development process so that it is agile and efficiently reflects the best available thought on the art and science of military operations.

## The Army Doctrine Hierarchy

The Army's warfighting doctrine is organized in a three-tiered hierarchy that provides a structure for developing and implementing Army doctrinal publications. Tier 1—Army is the highest-level tier and includes those publications that offer a broad perspective on Army operations and include capstone, keystone, joint related, Army interest, and combined arms. There are 132 Tier 1 FMs and include FM 1 and FM 3-0. Tier 2—Proponent is the second tier and designed to capture the bulk of proponent-level FMs. There are currently 227 Tier 2 FMs and includes all the proponent's principal doctrinal publication along with FMs covering functions, units, and the employment of Soldiers and systems. Tier 3—Reference is the final tier and groups those FMs that contain information that seldom changes and could apply to any Soldier or unit. There

are currently 132 Tier 3 FMs and include tasks such as providing first aid, physical training, and marksmanship.

## Warfighting Doctrine Development During Transformation

To support the Army Transformation, TRADOC is facilitating the development of doctrine on the familiar three axes of Transformation under the provisions of the Final Draft of TRADOC Regulation 25-36, *The TRADOC Doctrinal Literature Program*. Along the first axis, TRADOC is developing tactics, techniques, and procedures (TTP) for the Interim Brigade Combat Team (IBCT); along the second axis TRADOC is revising division and corps doctrine to link with joint and multinational doctrine; and along the third axis, TRADOC is revising the existing Army doctrine in accordance with the Doctrine Master Plan, which is a prioritized listing of all Army, joint, multiservice, and multinational doctrine maintained by the TRADOC Deputy Chief of Staff for Doctrine (DCSDOC) and used to obtain and prioritize limited resources for doctrine development.

The recent publication of FM 3-90 (formerly 100-40), *Tactics*; and the publication of other key doctrinal publications in the very near future such as FM 3-91 (formerly 71-100), *Division Operations*; FM 3-93 (formerly 100-7), *Decisive Force: The Army in Theater Operations*; FM 4-0 (formerly FM 100-10), *Combat Service Support*, FM 5-0 (formerly 101-5), *Army Planning and Orders Production*; and FM 6-0 (formerly 100-34), *Command and Control*, will expand upon the doctrine in FM 1 and FM 3-0, and contain key concepts of the Army Vision to set the stage for the Army Transformation. As these same publications come due for revision around 2006/07, the effort for developing Brigade Combat Team doctrine will merge with the execution of the Doctrine Master Plan, and Transformation tenets will be nested in fundamental publications to reflect transformed doctrine as we move to Objective Force. The various TRADOC proponent schools and centers are developing IBCT Doctrine and TTP using the Initial Force Organization and Operations (O&O) as a framework. The doctrinal material consists of a small set of core publications (Tier 1) to guide the training and early organizational refinements of the IBCT, and follow-on doctrinal publications (Tier 2) that support the core publications, derived from unit training, lessons learned, and unit feedback. The management of Tier 2 Doctrine is decentralized to proponents who determine timelines, content, and scope.

Division and corps doctrine is being revised to address the command and control ($C^2$) and support requirements of the IBCT, and to provide the requisite "hooks and links" for joint and multinational operations. Army doctrine must also be nested in, rather than simply compatible with, current and emerging joint and multinational doctrine to address the capabilities of the IBCT, and eventually the Objective Force. Development of division doctrine continues, and corps doctrine remains on-hold pending the approval of the Interim Division O&O and the corps redesign, currently scheduled for FY04. The Army Vision, announced by the Army Chief of Staff in October 1999, gave

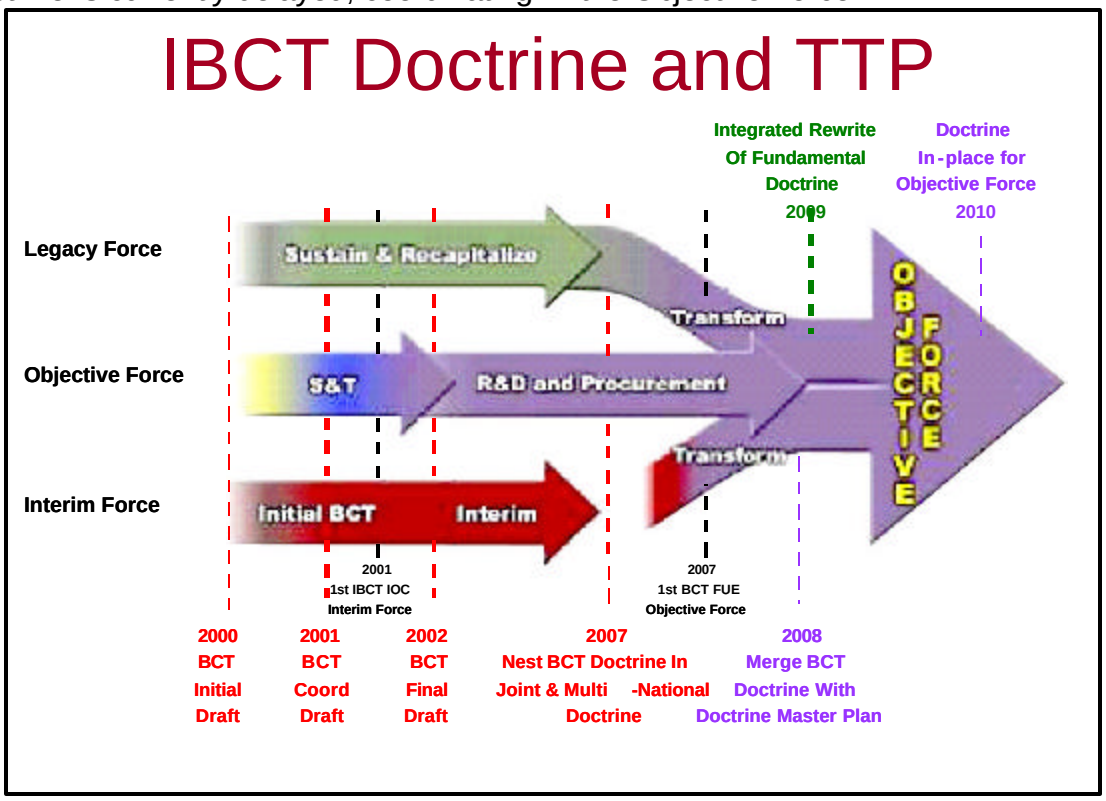
TRADOC the opportunity to incorporate the key concepts of that Vision into doctrine to begin Transformation. As the Army transforms, IBCT doctrine will eventually be integrated into the Doctrine Master Plan, at which point the key concepts will be nested in all publications and become transformed doctrine.

## IBCT Doctrine

A total of 26 Tier 1 IBCT initial draft field manuals were produced by the proponent schools and centers and delivered to Fort Lewis in the spring of 2000. The IBCT is testing and providing input on these doctrinal publications that will help develop and refine the doctrine for the future. These doctrinal manuals are scheduled for final staffing and testing during the first half of 2002. Though the development of division and corps doctrine is currently delayed, coordinating drafts will be staffed and tested prior to the first IBCT's Initial Operational Capability (IOC), projected for May 2003, to support its training and/or deployment.

## Conclusion

The Army's doctrine must enable core warfighting capabilities while increasing strategic responsiveness and dominance over an expanded range of mission environments and threats. These efforts to shape Army doctrine will continue throughout the mid-term and far-term. By the mid-term, TRADOC will reform our doctrinal development process so that it is agile and continues to reflect the best available thought on the art and science of military operations; and in the far-term, ensure that an integrated rewrite of fundamental doctrine is accomplished to provide relevant warfighting doctrine for the Objective Force.



# Annex C: Training and Leader Development

**Appendix 1: Initiatives within the Imperatives**
**Appendix 2: Objective Force (OF)**
**Appendix 3: Training Modernization**
**Appendix 4: Army Distance Learning**

## General

The Army Vision of being more strategically responsive and dominant at every point on the operational spectrum is about people, readiness and transformation. People are the centerpiece of our formations, and leadership is our stock in trade. Training Soldiers and growing leaders remain essential missions for the Army. Soldiers must be highly trained across the spectrum of military operations. Leaders must be educated for rapid synthesis of information, intuitive assessments of situations, and rapid conceptualization of friendly courses of action. They must be comfortable with giving and executing decision-type orders. They must be able to clearly define their information requirements and, most importantly, develop and effectively communicate their intent. Units and leaders must be highly trained and disciplined in the use of information technologies that can assure timely delivery of critical information. A main effort in Army Transformation is linking training and leader development to prepare Army leaders for full spectrum operations. Linking these two imperatives commits the Army to training Soldiers and growing them into leaders. Training and Leader Development functional activities are primarily coordinated within the Transformation Campaign Plan in the Trained and Ready axis in Lines of Operations 3, Manning and Investing in Quality People; 4, Maintain Unit Readiness and Training; and 5, Training and Leader Development.

The Army identified seven Training and Leader Development Imperatives in the Army Training and Leader Development Officer Panel (ATLDP-O) that are keys to success in achieving the Transformation objective. The seven imperatives, pending the results of subsequent panels, served as the baseline for management of Army training and leader development and are categorized as: Army Culture, the Officer and Noncommissioned (Leader) Education System, Training, Systems Approach to Training, Training and Leader Development Model, the Training and Leader Development Management Process and Lifelong Learning.

The Army Training and Leader Development Panel Officer Study was the first step in addressing leader development concerns. Assessment will continue through completion of the Noncommissioned Officer (NCO), Warrant Officer, and DA Civilian studies. The NCO panel convened its Strategic Conclusions and Recommendations Conference in late November 2001 and expects to publish its final report in the second quarter of FY02. The NCO Study's emerging strategic findings and conclusions fall under six of the seven imperatives established during the ATLDP Officer Study—Army Culture, the Education System, Training, Systems Approach to Training, Training and Leader Development Model and Lifelong Learning. The Warrant Officer study is

underway and will be followed by a DA Civilian study.

## Appendix 1: Initiatives within the Imperatives

### Army Culture

The Army recognizes the strong relationship between Army Culture and the quality of training and leader development programs. Our culture is the common thread running throughout all aspects of Army training and leader development. The Army must operate routinely within an acceptable band of tolerance to effectively train Soldiers and grow leaders; thus, an Army Culture imperative has been initiated. The underlying theme of this imperative is to demonstrate the Army's commitment by providing values-based leadership and well-being for our Soldiers and their families. The Army Culture imperative addresses numerous issues to include the concepts of an Army service ethic and officership, and the officer's role in the Army profession; the well-being of Soldiers and their families; Officer Personnel Management; and Mentoring.

An operational definition of the Army Service Ethic has been developed and FM 1, *The Army*, has been published. Doctrine on Officership and the Army Profession is being developed and will be published in FM 6-22, *Army Leadership*. The Army has demonstrated a commitment to the well-being of our Soldiers and their families. This commitment will be demonstrated through a coherent effort to monitor and resolve many issues that affect the well-being of Soldiers and their families. This commitment includes efforts to address issues in medical care, education, family support, housing and installation support, and many others. A Well-Being Division has been established to focus efforts and a Well-Being Campaign Plan is being developed.

Mentorship is a proactive commitment to foster growth in Army leaders based on mutual trust and respect. Mentorship is a combat multiplier that magnifies the effects that counseling, role modeling, coaching, teaching and advising have on leader development. The framework for the Army Mentorship Program is in place. Mentorship can be viewed from various perspectives. For some, mentorship is a relationship between a leader of senior rank and a leader of junior rank—a relationship that has both professional and personal aspects. Because the relationship is personal in nature it cannot be institutionalized as an Army program. Another view of mentorship is that it is the passing of knowledge and experience from an experienced individual to someone with less experience. This interpretation can clearly be institutionalized within the leader development and education system. Leader development through mentorship can be accomplished by assigning additional senior instructors to the junior level courses, creating a reach-back system that allows Soldiers in the field to access subject matter expertise and experts throughout the Army, and educating our force on the powerful leader development aspects of mentoring and each Soldier's professional responsibility to put these concepts into practice.

Army Culture is representative of the goodness in American society as evidenced by the Army's adoption of the seven core values: loyalty, duty to country, respect, selfless service, honor, integrity, and personal courage. These values play a critical role in shaping the beliefs of Army Soldiers and leaders. Leaders must be sensitive to instituting any policy or procedural changes that widen the gap between Army beliefs and practices and make it more difficult to train Soldiers and grow leaders.

## Leader Education System

The Army's officer and NCO education systems are key in inculcating full spectrum operations doctrine throughout the Army and developing leaders who know "how to think." Recent Army Training and Leader Development Panel reports indicate, however, that the quality and relevance of the Officer Education System (OES) and Non-Commissioned Officer Education System (NCOES) instruction are not meeting the expectations or needs of many officers and NCOs. Accordingly, these education systems are being transformed to meet the requirements of the Objective Force. The end state of this transformation process is an officer and NCO corps of self-aware and adaptive leaders, trained and educated to standard, and committed to life-long learning. Achieving this end state requires new approaches that focus each school on a central task and purpose, links schools horizontally and vertically in the educational process, synchronizes the educational and operational experiences of officers and NCOs, and educates to established, common standards. Several principles will guide the transformation of institutional training and education:

- Right education, right leader, right place and time
- Bonding, cohesion, and trust in cohorts
- Combined arms and joint operations
- Sequential and progressive
- Standards, assessment, feedback, and accreditation
- Life-long learning
- Reinvigorating the study of history
- Rekindling the passion for training

To support attainment of critical leader skills, knowledge, and attributes, resident school curricula will increasingly focus on teaching the art and science of battle command in both war and stability and support operations. The increasing importance of self-aware and adaptive leaders in full spectrum operations requires OES and NCOES to educate Army leaders on these qualities. The contemporary operational environment requires leaders who can think critically and, when necessary, devise innovative solutions to new and unexpected challenges. Specifically, leaders must be able to visualize the operation, describe it in terms of intent and guidance, and direct the actions of subordinates within their intent, all against a hostile, thinking enemy. Resident curricula must be designed to instill an appreciation for this learning requirement, while teaching leaders to be mission-focused, performance-oriented, technically and tactically competent, self-aware and adaptive.

## Training

The Combat Training Center (CTC) program and the fundamentals of Army training doctrine are sound but must be adapted to the changed strategic environment. The Army training system is being revitalized by updating training doctrine, improving home station training, and modernizing the CTCs. Training doctrine (FM 7–0 (25–100), *Training the Force*, and FM 7–10 (25–101), *Battle Focused Training*) is being adapted to account for the Contemporary Operational Environment (COE) and linked to joint operational (FM 3–0 (100-5), *Operations*) and *leadership* (FM 6–22 (22–100), *Army Leadership*) doctrine. The Army must provide commanders with the necessary resources. This includes increasing the availability and quality of Training Aids, Devices, Simulations and Simulators (TADSS) to support training.

The availability and quality of TADSS to support training will be increased. Embedding training capabilities developed through the Simulations and Modeling for Acquisition, Requirements and Training (SMART) initiative, is the preferred method of fielding models and simulations. Although it is not economical to retrofit fielded systems with embedded training capabilities, Project Managers and Program Executive Officers should focus training resources in this area. Fully embedded training capabilities and performance support systems offer many advantages to Soldiers, crews, units, and leaders; combat, training, and materiel developers must work closely to ensure that the right mix of embedded, appended, and stand alone TADSS is procured. Deputies for Systems Acquisition, Project Managers, Program Executive Officers and Major Army Commands (MACOMs) have been directed to conduct a thorough analysis of all TADSS requirements, fielding schedules, upgrades, and post production software support. TRADOC is reviewing and validating TADSS distribution for fielded and programmed systems to ensure compliance. Project Managers will adjust programs as appropriate.

CTC instrumentation, simulations and training aids are essential to achieve the goals of the CTC vision. The Army will achieve instrumentation commonality across the CTCs, which accommodates a standard after-action review to enable a fluid exchange of information and lessons learned. Tactical engagement systems must replicate the effects of future weapon systems, such as non line-of-sight weapons, and be inextricably linked to development of common instrumentation architecture. Enablers that facilitate a first-class training experience, common training instrumentation architecture, instrumented weapon systems, digital ranges and targets, Army Battle Command System (ABCS) digital linkages for observer-controllers, and instrumented maneuver live fire and urban operations are essential to CTC relevance. The future family of simulations must support CTC training. Program Managers will include CTC considerations in their system fielding plans and life cycle planning.

The purpose of the Army's CTCs is to develop leaders. Their mission, according to Army doctrine, is to provide highly realistic and stressful combined arms training that approximate actual

combat. Today's CTCs provide tough, realistic, multi-echeloned, and fully integrated training for Soldiers, leaders, and units. They produce bold, innovative leaders to deal with complex situations, flexible Soldiers with the warrior ethos, and well-trained units. The CTCs of the 21st Century must continue to achieve these results across the full spectrum of conflict. The history of the CTC program and the nature of future threats attest to the importance The Army must continually place on training the nation's Soldiers. The CTCs are leadership laboratories where units train under the watchful eyes of experienced observer/controllers. CTCs link the individual leader, the unit, and the institution together and have a synergistic effect on the leader development system as a whole. Along with operational deployments, the CTCs provide the most realistic, comprehensive, and multi-dimensional collective training experiences for units as they evolve into the Objective Force. Leaders are developed and mentored by experienced observer/controllers and receive feedback through an extensive After Action Review (AAR) process. Units train and improve collective skills and their effectiveness is measured in accordance with standards against a superbly trained, thinking opposing force with full-spectrum capabilities.

The Army must recapitalize, modernize, staff, and resource the CTCs to provide full spectrum, multiechelon, combined arms operational and leader development experiences. CTC modernization must include digitizing the CTCs at the same rate the Army digitizes to enable the CTCs and their Observer Controllers (O/Cs) to provide relevant stressful training experiences and accurate AARs. Additionally, each CTC must have the capability to exercise full-spectrum operations in a COE. The post Cold War World presents new strategic and operational challenges for the United States, which are incorporated into the COE. The COE includes key variables and problems for U.S. Armed Forces when conducting military operations in today's strategic environment. The OPFOR adjusts from a multi-echeloned force with known templates to an OPFOR that is less predictable, asymmetrical and full-spectrum capable. This COE places a new set of demands and educational requirements on future leaders in the areas of Joint Training, Warfighting Capabilities Training, and Technical and Tactical Training.

**Joint Training**

Leaders are increasingly required to lead joint, multi-national, and interagency operations. We must reengineer leader development and training programs to incorporate broader Army, joint, multi-national, and interagency knowledge and perspectives. The end-state will be Army leaders who demonstrate the values, character, competency and confidence to lead Soldiers, sailors, marines, and airmen—in any mission.

**Warfighting Capabilities Training**

The Army requires Soldiers and leaders steeped in the warfighting capabilities and doctrine required to execute combined arms operations in a full spectrum environment. They must be knowledgeable and experienced in how to analyze the ability of their units to operate and sustain themselves on the battlefield. Warfighting modules must

teach leaders standard U.S. Army techniques and procedures for tactical decision-making and the tactical employment of companies, battalions and brigades in combined arms full spectrum operations. Warfighting training must be tactically focused, hands-on, and execution-oriented. Training should culminate with an exercise that tests the leaders ability to rapidly make decisions and synchronize all of the battlefield operating systems within the battlefield framework of full spectrum operations. The intent of the warfighting curriculum is to produce an officer, warrant officer, or senior NCO who is proficient in combined arms maneuver, support, and sustainment of companies, battalions and brigades.

### Technical and Tactical Training

Competency is a major requirement for Army leaders and the foundation of this competency is achieved in technical and tactical training. The institutional schools play the premiere role during the initial stages of a leader's career when he receives the grounding in his functions. Schools will provide functional training in the new education system but this training will be delivered increasingly through distance learning and as exportable training support packages to the Soldiers and units in the field. Schools will continue to fill the role of subject matter expert and provide a reach-back capability for Soldiers outside of the schoolhouse to reach back to the institution for just-in-time information.

## Systems Approach to Training (SAT)

SAT is a systematic, spiral approach used to develop, implement, and evaluate collective, individual, and self-development training for the Legacy, Interim, and Objective Forces. It determines if training is needed; what to train; who is trained to what standard; where the training is presented; and what resources are required.

The SAT process is fundamentally sound but not well executed due to a shortage of training developers. Automation has compensated for some of the personnel shortfall by increasing TRADOC's ability to develop products faster and to make them more available to Soldiers. TRADOC is currently studying ways to further optimize the process. The study's goals are to make the training development process more relevant to the Objective Force environment and to produce products at a faster rate. This initiative will examine four focused areas: process, management, automation, and resources. Investments will be made to exploit network technology to develop a more streamlined and effective SAT process where training and doctrine publications are web-based and updated as the lessons learned from the CTCs are validated. The Army is recommitting to and reinforcing the importance of Standards-Based Training. MTPs/Army Training and Evaluation Plans (ARTEPs) are being validated and updated with priority to the Interim Brigade Combat Teams (IBCTs).

## Training and Leader Development Model

The Training and Leader Development Model being developed will show how training and leader development are linked. It will clearly communicate The Army leadership's intent and must be understandable for junior leaders, staffs, and outside agencies. The model is to be based on Army Culture; mandate standards for Soldiers, leaders, and units; provide feedback to Soldiers, leaders, units, and the Army; and balance operational and educational experience through education, assignments, and self–development.

The model will include an assessment and feedback process to enable self-examination of training and leader development systems. This process will allow the ability to establish priorities, adjust, and allocate resources to training and leader development programs to continue producing self-aware and adaptive leaders in trained and ready units. The products of the model are leaders who are mission-focused, doctrinally sound, performance-oriented, train as you fight, primary trainers who know themselves, and support lifelong learning and mentorship. The model will be all encompassing with respect to focusing institutional training and education, operational assignments, and advocating self–development in a lifelong learning paradigm. All three parts of the model are critical in producing quality leaders and all three, the institution, the unit, and the individual Soldier and leader, share responsibility for the training and leader process.

### Institutional Development

The Army must be supported by an institutional training and leader development system capable of providing the foundation for embedding full spectrum operational skills. This system must provide training (how to do) and education (what to know) and the opportunity to acquire the skills, knowledge, and attributes needed for the Objective Force. It must leverage the Army School System (TASS) assets, both Active (AC) and Reserve Components (RC), to maximize all training capabilities and foster unity of the Army team in support of Army readiness today and Objective Force readiness tomorrow. The training support system will focus on maximizing training readiness at units through embedded training capabilities in all their major warfighting systems. The role of the training and leader development system is very important, especially at major transition points—civilian to Soldier and direct leadership level to organizational leadership level.

Army readiness requires a holistic and mutually supporting training and leader development process. Each portion of the leader development triad (institution, unit, self) has a specific role and focus. The focus at junior levels is to inculcate new leaders and Soldiers with a common set of values and provide them with the minimum skills and knowledge necessary to achieve success in their initial assignment. At intermediate and senior levels the focus shifts to providing an educational environment and curriculum that increasingly exposes leaders to the nature and the art of war along with the scientific conduct of war. The Army needs leaders who know "how to think"

versus “what to think” at every level of command. To support this requirement, the institution must create an academic setting that produces intelligent, adaptive, politically astute, self-aware leaders that are capable and comfortable on the 21st Century battlefield.

**Operational Development**

Operational assignments play an important role in leader development by providing the Soldier the opportunity to translate theory into practice, and acquire specific expertise that is difficult to teach. Unit assignments give Soldiers the opportunity to practice the skills, knowledge, and behaviors learned in the institutional training base. Repetitive performance requirements refine the leader's skills, broaden knowledge, and shape behavior and attitude. Here a leader gains knowledge that is grounded in experience—and this expert knowledge can become truly internalized.

The Army requires leaders who have learned to lead and possess the skills and experience gained through operational assignments as well as the confidence and competence needed for more complex and higher levels of assignment. A Warrior Knowledge Network (WKN) will provide reach-back capabilities to the institution. WKN will provide the training products needed to continue the leader's experiential development in full spectrum complex operations at home-station and while deployed. It will also provide, in a useful format, the focused knowledge needed for job performance.

To meet the emerging leadership requirements of the Objective Force, units must have built-in structures for mentoring, coaching, counseling, teaching, and developing leaders through experiential training. Soldiers developed by noncommissioned officers, officers, and warrant officers who use their leadership skills in realistic training exercises will become the leaders of the Objective Force. Leaders learn the conduct of war by practicing fighting, maneuvering, supporting, and sustaining their unit in a field-training environment–experiential training. They learn the technical, tactical, and leadership requirements of the next major career phase through successive assignments in a unit where experiential training is the norm.

**Self-Development**

The Army must have Soldiers and leaders who continuously seek to improve their mental acuity and educational background. Self-development initiatives shape a leader's development by focusing on maximizing strengths, minimizing weaknesses, and ensuring that personal goals, needs, and objectives are realized. Self-development is a continuous, career-long process. It takes place during institutional training and development and during operational assignments, and should stretch and broaden the leader beyond the job or training requirements. Self-development actions may include self-study, professional reading programs, and civilian education courses that support the individual's developmental goals. Self-development supports the requirement for all leaders to be self-aware—to know their strengths and weaknesses in order to take the necessary steps to improve their skills,

leadership, and attributes. Army Culture and lifelong learning management actions will support Soldier self-development through distance learning, force structure, and policy adaptations.

The focus of self-development is twofold: to fill individual Soldier or leader training, experience, and education voids; and to ensure the Soldier meets personal and professional goals. The individual self-development portion of the leader development program is a joint venture between the individual and his or her chain of command.

## Training and Leader Development Management Process

The Army has implemented a training and leader development management process that is iterative, collaborative, and comprehensive. The process is designed to elicit relevant issues in a timely manner. This process starts with issues developed and forwarded by the Center for Army Leadership (CAL), as the Training and Leader development executive agent, or by other sources to the Training and Leader Development Councils of Colonels. The Councils of Colonels, focused on the three training and leader development domains (Home Station/Deployed, CTC and Institutional), are supported by three training enabler Council of Colonels (Training and Leader Development, Training Mission Area, and Standards in Training Commission) and staff agencies responsible for synchronization and integration of other sub-components within the strategic leader training and development program to include accessions, evaluations, selections, promotions, and others. Results of the Councils of Colonels and other subcomponents are synchronized and recommendations are provided to the Army leadership through the Training and Leader Development General Officer Steering Committee (TLGOSC). This process results in prioritized issues, a measure of progress in addressing training and leader development issues, a means to adjust priorities, and recommendations to the Chief of Staff, Army (CSA) about applying resources.

## Lifelong Learning

Learning organizations support self-awareness and adaptability. Lifelong learning requires standards, tools for assessment, feedback and self-development. Part of Army Culture is the commitment by its leaders to lifelong learning through a balance of educational and operational experiences, complemented by self–development to enhance knowledge that educational and operational experiences do not provide. To be an organization that supports this lifelong learning the Army must—

- Provide the training and educational standards and products that are the foundation for standards-based training and leader development.
- Provide the doctrine, tools, and support to foster life long learning through balanced educational and operational experiences supported by self–development.
- Develop, fund and maintain an Army-wide Digital Training Facilities (DTF) using information technology where Soldiers, leaders, and units can go to find standards, training and education

publications, doctrinal manuals, assessment and feedback tools and can access distance and distributed learning programs for self–development and lifelong learning.

- Provide the doctrine, tools, and support to inculcate the concept and practice of lifelong learning, self-awareness and adaptability in the Army's culture.
- Teach the importance of lifelong learning and the competencies of self-awareness and adaptability throughout the leader education system. Strengthen this approach in organizations and in self-development.

## Conclusion

People are central to the Army—they are the keys to achieving ready forces today and a transformed Army tomorrow. Effective Soldiers and Leaders—those who are self-aware, adaptive, and innovative—will solve unforeseen operational problems. Developing and maintaining this edge in the human dimension is critical to the success of Army Transformation and sustaining day-to-day operational readiness. The Army is committed to the development of its leaders at all levels. This commitment extends equally to all officers, warrant officers, NCOs, and Department of the Army Civilians of the Active Army, Army National Guard, and U. S. Army Reserves. Leaders must be appropriately developed before assuming and while occupying leadership positions — to ensure they are competent in and confident of their ability to lead at the level assigned. In short, the goal is to develop competent, confident leaders who can exploit the full potential of present and future doctrine.

# Appendix 2: Objective Force (OF)

## Requirement

Objective Force training and leader development must produce multifunctional leaders, Soldiers, and teams capable of full spectrum operations on the complex, demanding battlefields of the future. It must produce lethal, cohesive, and versatile organizations that achieve the highest state of operational agility and combat readiness through the balanced use of live, virtual and constructive training. The design of the Objective Force must allow its leaders to be capable of training their units without significant external support packages as well as to be innovative, creative risk-takers in both training and warfighting. Embedding training support packages and performance support systems into the Objective Force's organizational and system designs will further enhance readiness. Objective Force weapon platforms and equipment will be enhanced with a common set of operational and user interfaces that look, feel, and function in a similar fashion during training or combat operations.

## Training Challenges

The challenges posed by the changing operational environment, range of missions, and future operations require reevaluation and adjustments of all levels of individual and collective training at the institution and in units. Training for all ranks and military occupational

specialties must focus on gaining and sustaining high levels of experience on the technical and cognitive skills essential for operating and integrating the digitized command and control systems and on information assurance to maintain their security. Information systems literacy must be accompanied by proficiency in management of the vast quantity of information these new systems will make available. Training must assure that Soldiers, leaders and units are enabled rather than encumbered by technology. Training systems must keep pace with an ever-accelerating rate of change in required skills and knowledge covering broad fields of endeavor that must be developed to enable the Objective Force.

Due to the complexity of evolving systems and concepts, Soldiers will require more time to acquire and sustain the necessary proficiency using institutionally developed training before, during and between operational assignments. Distance learning and other innovative training systems and technologies will minimize the time spent away from units. Such training support capabilities will also minimize personnel turbulence, thereby promoting unit cohesion. Training also must help build an environment that challenges Soldiers and leaders as well as supports development of opportunity-based organizations that Soldiers want to join and in which they desire to play a continuing, active, integral role.

## OF Training Characteristics

Training gives the Army the capability to execute its published tactics, techniques and procedures (TTPs) concepts and doctrine. Mental and physical fighting agility only comes through experience and repetitive practice under demanding conditions. In accordance with the Army Training Strategy, OF training will be unit training that includes individual, crew, team, squad, higher training where Soldiers, and leaders collectively prepare for their unit's missions. Unit training also will include the critical battle staff training essential to synchronizing the effects of joint and combined arms operations on the battlefield. OF training will exploit the right mix of live and simulation tools to maximize the effectiveness of individual and collective training.

Some of the training characteristics will be:

- Training reoriented from process to experiential focus.
- Training requirements achieved through functional, job-related training-anytime, anyplace.
- Fully embedded, integrated, seamless, common training architecture as a critical component of the operational architecture that provides:
    - Synthetic training environment that links live, virtual and constructive simulation with battlefield systems.
    - En-route training and mission rehearsal.
    - Integrated, networked and embedded training aids and devices.
    - Improved unit readiness-embedded individual replacement training systems.
    - Portable training assets that enable units to train anyplace, anytime.

- Combat training centers (CTCs) serve as sites for capstone events to exercise doctrine and provide near combat experience.
- User friendly, reconfigurable, tailorable, and re-usable training support packages.
- Integrated training management capabilities.
- Integrated performance support and reach back capabilities.

## Unit Training

By design, unit training is the ultimate Soldier and unit experience before entering combat operations. OF commanders must continue to efficiently and effectively integrate all available resources to conduct unit training. Unit training must enable the combined execution of the OF Soldier, leader and battle staff to interact in a seamless, synergistic manner to reach operational capabilities and levels of readiness far beyond today's expectations and standards. OF unit training must maximize its operational potential by leveraging the characteristics of OF training to achieve and sustain the highest levels of operational readiness. Every unit must encompass Soldiers, staff members, and leaders that are proficient in performing their full array of assigned individual and collective tasks though use of rapid communications to interact through horizontal and vertical linkages to meet the most demanding standards of combat operations. To attain these high standards, units will train in a seamless operational/synthetic environment that enhances their training experience. This seamless environment will provide training opportunities for units, leaders, staff officers, and staff cells, as well as independent individual self-development training. Each OF unit will be supported with:

- A Combined Arms Training Strategy that has unit, individual and self development components;
- A fully, seamless, embedded interactive training management system;
- A performance support system that provides "just in time" training, tracks Soldier errors for future training, and provides a portal to "reach back" for training not immediately available from the system;
- A training support infrastructure that supports unit training at homestation, deployed, CTCs, and institutions;
- Institution-developed nested, sequential, gated training products and doctrine that are always available.

## The Training Support System (TSS)

The training concept for the OF will exploit revolutionary training and leader development capabilities using a robust training support system-of-systems approach. The training support provided to the triumvirate of institution, operational assignments, and self-development is critical to producing quality Soldiers and leaders.

This system-of-systems approach, or TSS, will enable self-development, individual, and collective training at the institution, home station, deployed operational theater, and CTCs.

The TSS will enable implementation of an Army Training Strategy focused on developing adaptive leaders and lethal small units given the importance of time, resources, and environmental stewardship. The Army's Soldiers and leaders must be competent and confident in their warfighting skills and possess the ability to rapidly adapt to changing technological developments and mission requirements. The TSS will capitalize on proven and emerging training and information technologies to deliver quality functional training via distance learning, employ synthetic training tools to sustain combat readiness, and develop leaders through experiential learning and feedback in a life-long learning environment. While live training will remain the cornerstone of the OF, integrated virtual and constructive applications will be leveraged to overcome training constraints.

The TSS will:

- Enhance individual, unit, institutional, and self-development training by providing technologies and architectures that increase Soldier and leader accessibility to training products anytime, anywhere.
- Support the development of training, and doctrine products while minimizing duplication by horizontally and vertically integrating the course content and delivery methods.
- Provide standards and architectures that allow for the development of integrated, interoperable training support and training management outputs and services.
- Provide the means for exercise control, training and scenario management, and battlefield realism through automated training instrumentation systems and models and simulations, and tactical engagements systems.
- Provide the means to perform verification, validation, and configuration management.
- Enhance the ability to evaluate training events through automated data collection, reduction, and application strategies and remediation tools.
- Provide scenarios for effective training, testing, and remediation to ensure consistent training support strategies, standards, and formats.

## Embedded Training

Paramount to the OF training and TSS concept will be individual and collective training applications that are fully embedded in the design of the Objective Force systems, Future Combat Systems (FCS) and Objective Force Command, Control, Communications, Computer, Intelligence, Surveillance, and Reconnaissance (C4ISR) systems. The ability to train and sustain Soldier skills will be a key performance parameter in materiel acquisition programs that support the OF and Army modernization and recapitalization programs of legacy systems identified for the Objective Force. The materiel design will provide commanders a fully integrated, non-detachable, embedded training system usable on demand to support individual and collective training at institutions, home station, CTCs, while deploying, or

deployed and employed. As a minimum the embedded training capability will:

- Provide training modes that overlay the system's normal operations.
- Allow initial and sustainment training (Institution, Home Station, Deployed/CTC).
- Allow individual and collective practice with equipment.
- Generate operational input data (Target, Threat, Enemy, Friendly, etc.).
- Feed input to the operational equipment by means of normal input, output, and displays.
- Present input, output, and displays realistically.
- Require users to perform normal task duties in response to input, outputs, and displays.
- Exercise total system (Including degraded operations).
- Enable seamless live, virtual, and constructive training.
- Allow training data collection, management, and assessment.
- Provide individual and collective feedback (AAR, coaching, mentoring, etc.).
- Enable tailoring of unit individual and collective training requirements.
- Provide seamless interface between training and operational environments.

## Training Architecture

The Operational Architecture will bring units, battle staffs and commanders together in virtual work environments freeing commanders from their command posts, enhancing the capabilities of supporting staffs and facilitating the use of expertise from linked units and supporting theaters. To maximize this operational capability, the training architecture will be an inherent part of the operational architecture and will play a central role in training commanders and their staffs in decision making skills, and a greater role in training at lower organizational levels. Using their assigned systems, commanders and staffs at all levels will be able to conduct constructive training events that currently require dedicated facilities and overhead resources.

In order to maintain both system and unit proficiency, the training architecture must support individual and unit training in any environment and units must consistently train as a part of a combined/joint arms team. The training architecture will enable embedded training to be modular and adjustable to the skill level of the operator. Systems with embedded training capabilities must have the ability to train a unit at the individual level or collectively, with models, stimulations, and simulations that allow maximum flexibility with minimum overhead. The training architecture, inherent in the design of the operational architecture, will provide reach back, reusable, configurable training and allow all Soldiers to train as they will fight in any operational environment.

## Institutional Training

Our current curriculum models are derived from the McNair mobilization, education and training model that produced the

units, Soldiers, and leaders required to meet the operational requirements of World War II and subsequent Cold War. Based on total mobilization and focused on the production of Soldiers and leaders with narrowly focused, branch-centric basic skills, these models are no longer sufficient.

Training and Doctrine Command (TRADOC) must provide The Army with Soldiers and leaders with standards-based competencies who can successfully lead and train their units and fully integrate combined arms capabilities in a full-spectrum operational environment. This combined arms, full-spectrum operational perspective is the foundation for the development of the curriculum to support all our training and education requirements and provides the strategic underpinning for the human dimension that leads the Army's Transformation to the Objective Force.

Transformation of the Professional Military Education (OES, WOES, NCOES, DACES) will utilize key findings from the applicable Army Training and Leader Development Panels (ATLDP) and link to anticipated requirements in developing full spectrum leaders. Focusing on crucial development periods in a leader's career (lieutenant through major), the new PME will build military and DA civilian leaders for the Objective Force through progressive and sequential education experiences.

To implement key findings of the Officer ATLDP, training and leader development will focus on extending company grade officers in their first unit until after company-level command to increase competence and confidence in small unit operations. The Basic Officer Leader Course (BOLC I/II) will replace current branch officer basic courses with two phases, first embedding service to Army, officership, and platoon leader competencies (Phase I), then relocating lieutenants to respective branch schools for technical, tactical, and functional training (Phase II). Upon selection for promotion and assignment as a staff officer, officers would be programmed for the Combined Arms Leaders Course (CALC) to receive tailored training for that next portion in a full spectrum environment. When selected for command, officers would report to the Combined Arms Battle Commanders Course (CABCC) to receive challenging combined arms training at the company level. This course is envisioned to consist of a distance learning (DL) prerequisite, a Center-Branch technical phase, and an experiential phase at a CTC. In the field grade years, the proposed Intermediate Level Education (ILE), replacing the current CGSOC format, would provide a broader operational warfighting educational perspective in joint and operational doctrine and warfare. PME for the Pre-Command Course would also include an experiential phase at one of the CTCs while the Army War College would remain the same.

The end result in this proposed career path for Objective Force leaders is full spectrum officers at every level who think and adapt earlier in their careers, possess technical competence, are committed to continuous learning, and are grounded in doctrine. It also will produce officers who have received a military education that has first trained them as Army officers and leaders, then prepared them for a specific career field or

functional area. Pilot courses for the new OES courses are scheduled for FY02/03. The respective Training and Leader Development Panels for Warrant Officers, NCOs, and DA Civilians (programmed for completion in FY02) will provide necessary input for implementation of curricula and leader development redesign.

In support of a transforming Army, our training and leader development programs must prepare Soldiers and leaders to conduct full spectrum operations upon arrival in their units. Accomplishing this goal requires that institutional training and education be mission-focused, doctrinally based, and performance-oriented. We must develop standards and expectations for each course, assess performance against these standards, and provide feedback. PME will reinforce the Army's commitment to life- long learning by providing standards based instruction. Retraining will be conducted as required. Building confidence, teamwork, trust, cohesion, and competence in students and cadre is paramount. TRADOC is committed to ensuring that the U.S. Army remains the world's best—we owe it to our Soldiers and the nation.

## Homestation Training

The training support infrastructure must provide a seamless training/operational environment to meet individual, unit, and multi-echelon training requirements supported by an invisible simulation and stimulation, reach-back, evaluation and assessment tools, and performance support training. To be defined is what will encompass this training environment. Fixed Tactical Internets, Battle Simulation Centers, Mission Support Training Facilities, Multi-Purpose Digital Range Complexes, Home Station Instrumentation Systems, etc., may be required to support institutional, individual, and unit training depending on the robustness and capabilities of the OF operational systems. As unit commanders do today, OF commanders will continue to adapt and prioritize their Mission Essential Task List and training plan to meet their ever-changing, full spectrum mission set. Unlike today's units, OF units will use a robust performance support system to access assessment information to maximize training opportunities and tailor training to meet the needs of Soldiers, trainers, leaders, and managers to enhance operations of sections and combat readiness of units.

## Combat Training Centers

Short of actual operational missions, the full–spectrum operational environment required to produce the Soldiers and leaders needed for the Objective Force will occur at the Combat Training Centers (CTC). CTCs provide the most realistic, comprehensive, and multi-dimensional collective training experience for units as they evolve into the Objective Force. Leaders are developed and mentored by experienced observer/controllers and receive feedback through an extensive After Action Review (AAR) process. Units train and improve collective skills, and their effectiveness is measured against a superbly trained, free–thinking and adaptive opposing force.

## Training When Deployed

The OF systems will allow the Soldier and unit to train before, during, and after deployment into the operational area. For the Soldier and unit, training in the deployed domain will be just like training at homestation or a CTC. The deployed training environment will be seamless, training products will be readily available, and simulation/stimulation will provide for robust training for each OF Soldier and unit. This will allow them to both enhance their theater specific skills and sustain operation readiness while responding to mission requirements.

## Conclusion

Successful Army operations are grounded in the human dimension—the heritage of America's Army. Effective Soldiers and leaders—those who are adaptive, self aware, and innovative—will solve operational problems not now imagined. Developing and maintaining this edge in the human dimension is critical to the success of Army transformation to the Objective Force. Along with an investment in technical innovations we must make significant and long-term investments in training and leader development to maintain the advantage in full spectrum operations.

# Appendix 3: Training Modernization

## General

Training Modernization has not kept pace with the Army's Force Modernization effort. The Army is fielding systems, building new organizations, and crafting new doctrine without the associated Training Support System (TSS), i.e., the training enablers and training support infrastructure needed to train to standard. Additionally, decreasing resources, increasing weapons systems range and lethality, increased deployments, and environmental constraints are limiting the Army's ability to train. These factors, coupled with the broad force projection mission, the need for mission rehearsal capabilities, and the digitization of future forces, point to a need to leverage the rapid growth in technology to improve training proficiency with the smart use of TADSS and automated command and control (C2) systems. System and non-system TADSS support the major objective of an overarching Army training strategy, that being the establishment of policy supported by adequate resources to accomplish defined training and mission rehearsal capabilities for the Legacy, Interim, and Objective Forces. Training transforms people, equipment, and doctrine into capabilities. From a modernization viewpoint, this objective is supported by the effective and efficient integration of systems and non-systems training technologies and development within the live, virtual, and constructive simulation environments across the homestation, deployed, CTC, and institution domains.

While today's TADSS supplement live training, tomorrow's TADSS must provide the commander with deployable and portable combined arms collective training and mission rehearsal capabilities, extending to include joint operations, and enabling units to train and rehearse missions in a resource-constrained environment at home station

and deployed locations. The vision is to build a synthetic training environment that links live, virtual, and constructive simulation environments with “fair fight” capability. "Digitizing the battlefield" to provide seamless, digital C2 capabilities for the entire fighting force is one of the Army's top priorities. To meet this requirement, multiple initiatives are underway to harness the power of the microprocessor and information technology for warfighters. The goal is to use digital technology to maintain a continuous edge in projecting and employing combat power on future battlefields. Mirroring this effort are initiatives to embed the complex, combined arms structured training of the future into the systems of the digitized force.

**The Training Support System (TSS)** is a system of systems made up of several parts that are interconnected to form a whole. This system-of-systems approach, or Training Support System (TSS) will enable self-development, individual, and collective training at the institution, home station, deployed, and CTCs. The interconnected parts include training information infrastructure; training aids, devices, simulations, and simulators (TADSS); and training support products, services, and facilities. From these parts come the tangible outputs that trainers and Soldiers need to train effectively. The pieces that link these outputs are the architectures and standards that enable their interconnectivity and interoperability. The integrated TSS must support training environments that provide Soldiers the skills necessary to deal with a variety of conditions, unknown factors, and different enemy types, including a power, organization, agency, or situation that is an obstacle to accomplishing the mission. While time will remain a fixed or shrinking resource, leaders, Soldiers, and units will require expanded experiences that are more frequent and broadly based to attain full spectrum dominance within this new environment. It will be critical for leaders to be comfortable with exercising the maximum amount of initiative bound only by the commander’s intent. In addition, the integrated TSS must foster conditions that help leaders understand a given situation, enabling them to effectively lead a force that can maneuver rapidly and make contact. It also must be deployable with a unit. It must be capable of operating in immature theaters with no organic infrastructure. In essence, the unit must be able to tailor the TSS with what it initially needs and then modify the capability as training support needs change over time. To accomplish this, the TSS must leverage a fully integrated and often embedded toolbox of live, virtual, and constructive simulations and interactive multimedia instruction with all the supporting requirements in all training environments.

**Systems Training.** Training with Digital Systems continues to present challenges to the force. Although the Army is fielding digital systems worldwide their integration into training—live, virtual, and constructive environments, lags several years behind. PMs and PEOs must fund the integration, upgrade, and modernization of TADSS as a result of upgrades and modernization to their systems (both hardware and software).

PMs and PEOs fund their systems TADSS along with the weapon system. They also fund integration of their systems and TADSS into the CTCs as well as

changes to all TADSS (system and nonsystem) as a result upgrades and modernization of their systems (ARs 71-9 and 350-38). The G-8 monitors this requirement in the Systems Reviews.

In the long term, embedding training capabilities is the preferred method of fielding TADSS. Embedding training capabilities, developed through the Simulations and Modeling for Acquisition, Requirements and Training (SMART) initiative will enhance training capabilities for the Soldier.

**Live Simulation Training** is executed under battlefield conditions using tactical equipment. It includes individual and collective field training performed at training institutions, home station, CTCs, live fire ranges, and while deployed in support of military operations. Live training emphasizes the fidelity of field training under battlefield conditions and standards and is supported by a toolbox of TADSS, instrumentation systems, targetry, and training unique ammunition. Aside from gunnery training, live maneuver training normally incorporates Tactical Engagement Systems (TES) to simulate combat conditions. TES training methodology is characterized by free interplay of forces, using a real time casualty assessment system that reinforces training tasks through immediate feedback response to correct and incorrect individual and collective task accomplishment. Live training is the most resource intensive form of training and is used to reinforce skills previously trained during the crawl and walk stages of the crawl-walk-run training progression. While live training can never be replaced, the application of technology can provide live simulations to enhance traditional field/range training and offset restrictions imposed on live training by high technology weapons systems, safety, environmental sensitivities, and higher training costs.

**Virtual Simulation Training** provides crews, leaders and units with realistic, immersive training experience using man-in-the-loop simulators that approximate the physical layout of tactical weapons systems and vehicles, and is executed on computer-generated battlefields. In the virtual environment, simulators operating on virtual terrain take the place of weapons systems and can be linked together to expand the scope of the training event. Virtual training systems provide commanders with "walk-level" and sustainment training, leader development, and mission rehearsal capabilities. Through frequent and repetitive use and an immediate and total replay AAR capability, virtual training systems assist commanders with the building and sustaining of training readiness. Virtual training also has the advantage of allowing Soldiers to perform tasks too dangerous for the live environment (such as calling for artillery fires on or near an occupied friendly position), provides the capability for rapid changes to scenarios, and facilitates retraining specific tasks until training objectives are met. Virtual simulations allow repetitive training under varying conditions to enable the individual or team to conduct live training at a higher state of readiness, potentially reducing OPTEMPO requirements. Many virtual simulations also provide a link to Army Battle Command Systems (ABCS), thereby providing a realistic training environment for the digitized units and battle staffs.

**Constructive Simulation Training** is the use of computer models and simulations to exercise the command and staff functions of units from platoon through Joint Task Force. Constructive simulations permit multiple echelons of command and staff to execute their normal warfighting tasks in an extensive exercise without the resource constraints of large bodies of troops. Constructive simulations provide a versatile and cost-effective low overhead training environment that trains leaders on how to visualize the battlespace and to make tactical decisions in a time-constrained, digitized environment. Through the repetitive execution of tactical scenarios followed by AARs, commanders and staff officers gain a realistic understanding of how to take advantage of the enhanced situational awareness afforded by the Army Battle Command System.

**Training with Digital Systems** continues to present challenges to the force. Although the Army is fielding digital systems worldwide, their integration into training—live, virtual, and constructive environments—lags several years behind. Project Managers and Program Executive Officers must fund the integration, upgrade, and modernization of TADSS as a result of upgrades and modernization to their systems (both hardware and software).

## Nonsystem TADSS that Support the Homestation and Deployed Domains

**Multiple Integrated Laser Engagement Systems (MILES) XXI.** MILES XXI provides tactical engagement simulation for direct fire force-on-force training using eye safe laser "bullets." MILES training has been proven to dramatically increase the combat readiness and fighting effectiveness of military forces. Enhancements include discrete player identification for all participants, enhanced audio-visual cueing effects, event recording and display, increased programmability of weapon characteristics, and increased ability to account for side, flank, corner, and rear shots.

**Army Targetry Systems (ATS)/ New Generation Army Targetry Systems (NGATS).** ATS provides non-digital, live-fire ranges that incorporate infantry and armor targets, both stationary and moving, that portray realistic opposing target threat scenarios to the Soldier under simulated battlefield conditions. NGATS is the future Army ground targetry system that will provide high fidelity target signatures, evasive targets, shoot-back capability, and remote scoring. Using commercial-off-the-shelf technology NGATS will provide a more reliable system at lower cost. The NGATS will be mobile, transportable, deployable, and capable of continuous support during designated training periods.

**Air Defense Targets (ADA Targets).** ADA Targets provide targets and ancillary devices for gun live-fire crew weapon qualification and training events currently resourced under STRAC. It provides required training and opportunity training to the Air Defense Soldiers for gun and STINGER missile live fire.

**Corps Battle Simulation (CBS) Program**. CBS provides a discrete event simulation that is designed

specifically to train Army Corps and AC & RC Division commanders and staffs. This simulation serves as the ground model when linked in the Joint Training Confederation with models from other services. CBS models ground movement, ground combat, artillery, air defense, engineering, NBC, resupply, medical support, maintenance, radar and electronic counter measures, electronic warfare, fixed and rotary wing air operations, special operating forces, and airlift / airdrop. CBS is used during Warfighter Exercisers and allows the commander to fight his organization and assess its training proficiency. The corps and division command and staff personnel fight the battle from field command posts (CPs). CBS is considered a legacy simulation with recent development efforts focused on aviation and air defense improvements. The simulation can be linked to ATCCS using Run Time Manager (RTM) simulation-to-ATCCS interface boxes. However, it cannot link with FBCB2. Until WARSIM is fielded, the Army must sustain (and enhanced as needed) CBS.

**Tactical Simulation (TACSIM).** TACSIM is a military intelligence training simulation used worldwide to provide training in the intelligence analysis, collection management, and intelligence portion of battle command. TACSIM accomplishes this mission by simulating and/or stimulating a wide spectrum of intelligence operations to include communications intelligence (COMINT), electronic intelligence (ELINT), imagery intelligence (IMINT), and human intelligence (HUMINT). While TACSIM can operate in a stand-alone mode, it typically works in conjunction with other simulation models, such as CBS, to support multi-echelon collective training. In addition, TACSIM fully interfaces with ancillary systems like META-VR (UAV), and the Secondary Imagery Generation System (SIGS) to garner greater fidelity of intelligence systems. TACSIM stimulates most active Army, multi-service, and national intelligence sensors and stimulates training audience organizational equipment such as the All Source Analysis System (ASAS). TACSIM must be sustained and enhanced until WARSIM (and the WARSIM intelligence model) is fielded.

**Engagement Skills Trainer (EST) 2000**. EST 2000 provides instructors a resource to support virtual marksmanship training at all skill levels for individuals, fire teams, and squads. It offers an opportunity to conduct and evaluate tactical training in a virtual simulated environment. EST 2000 replicates both small arms and crew-served weapons, as well as multiple shooting courses, can support training of up to 15 Soldiers at the same time, and provides an immediate AAR capability. EST 2000 also provides a judgmental use of force training capability through instructor manipulated shoot-don't shoot scenarios.

**Close Combat Tactical Trainer (CCTT).** CCTT uses various simulators, emulators, and semi-automated forces replicating combat vehicles, weapons systems, dismounted forces, combat support, combat service support, command and control, and opposing forces. It is networked to provide fully interactive unit task training (collective training) on computer-generated terrain. It is being fielded in mobile configurations (platoon level) for the Army National Guard and at fixed sites (company/team

level) to support armor and mechanized infantry training for the Active Component. CCTT supports the collective training of Armor, Mechanized Infantry, and Cavalry units from platoon through battalion/squadron level.

**Aviation Reconfigurable Manned Simulator (AVCATT-A).** The AVCATT-A system is a dynamic, alternative instructional means to train and rehearse, through networked simulation, in a collective and combined arms simulated battlefield environment. The AVCATT-A system is a critical element of the Combined Arms Training Strategy. It supports institutional, organizational, and sustainment collective (walk-level) training for Active Component and Reserve Component aviation units worldwide. Collective and combined arms simulation exercises will provide commanders with an affordable capability to train supporting individual tasks required to conducting collective training and rehearsals, the unit's mission essential task list, and combined arms wartime mission performance requirements. The AVCATT-A system will interoperate with other simulation systems through local area network and wide area network utilizing broadcast and multicast modes, will be Joint Technical Architecture-Army compliant, will be Synthetic Environment Core compliant, and will achieve fair-fight interoperability with the Close Combat Tactical Trainer. The AVCATT-A system will provide a fair-fight, realistic, high intensity, task-loaded, synthetic combat environment composed of attack, reconnaissance, cargo, and utility aircraft reconfigurable simulator platforms, semi-automated forces workstations, AAR capability, a Battle-Master Control console, and workstations for ground maneuver, fire support close air support, logistics, battle command, and engineer role players.

**Close Combat Tactical Trainer (CCTT) XXI.** CCTT XXI integrates Force XXI digitized command, control, communications, computers, and intelligence (C4I) systems into CCTT. Systems included are Force XXI Battle Command Brigade and Below (FBCB2) and The Army Tactical Command and Control System (ATCCS). FBCB2 is integrated into appropriate vehicles and command posts to provide situational awareness and command and control to the lowest tactical echelons. CCTT XXI facilitates a seamless flow of battle command information across the battle space, and interoperates with external command and control and sensor systems, such as ATCCS. The end result is a vertical and horizontal integration of the digital battle space at the brigade-and-below tactical unit levels. CCTT XXI integrates FBCB2/ATCCS digital capability into CCTT and provides the digitized force with both a robust virtual combined arms environment for collective training and an experimentation environment for training development. CCTT XXI provides the most robust, technically and fiscally feasible environment for training complex multiple step digitization tasks prior to execution in the live environment.

**Digital Battle Staff Sustainment Trainer (DBST).** Allows ABCS to interface with training simulations in major brigade Command Post Exercises (CPX) in a staff exercise environment. DBST uses Janus as the maneuver driver and is currently being used as a rehearsal tool by units preparing for National Training

Center (NTC) and Joint Readiness Training Center (JRTC) rotations. DBST realistically portrays the Joint Surveillance Targeting Acquisition Radar System (JSTARS) and unmanned aerial vehicles (UAV) in the simulation. DBST provides a "wrap around" capability to allow a commander to fight his live unit at the same time he is fighting a simulated deep enemy or operating with simulated friendly units on his flanks. DBST also allows FBCB2 to be simulated by computer simulation.

**Warfighters Simulation (WARSIM).** WARSIM is the next generation simulation for use in providing U. S. Army command and staff training. It is being developed to replace the current legacy simulation systems, CBS and TACSIM. It will use advanced modeling and simulation techniques to train Army divisions through echelons above corps commanders and battle staffs. WARSIM is a key enabling simulation for the training of the Army's commanders and staffs. This program will provide the Land Warfare functionality for the Joint Simulation System (JSIMS), a joint initiative intended to create a common, seamless training environment for the Services and joint community. As such, there is a high degree of inter-dependence among JSIMS, WARSIM, and the simulation programs of the other Services. As TACSIM provides an intelligence simulation for CBS, WARSIM Intel Model (WIM) is the intelligence driver for WARSIM. It can replicate division through national intelligence collection sources. WIM supports training of corps and division command posts and their associated military intelligence (MI) staffs.

**One Semi-Automated Forces (OneSAF).** OneSAF is a composable, next generation Computer Generated Force (CGF) that will represent a full range of operations, systems, and control process (TTP) from entity to battalion level, with variable level of fidelity and support for all models and simulations domain (ACR, RDA, TEMO) applications with an emphasis on human-in-the loop and no human in-the-loop. It also will represent the physical environment and its effect on simulated activities and behaviors. OneSAF will be the future entity level battalion and below constructive simulation that, when linked with WARSIM and the CATT family of virtual simulators, will seamlessly integrate live, virtual, and constructive simulations into realistic synthetic battlespaces. OneSAF will represent C4I, combat, combat support (CS), and combat service support (CSS). Its fielding will significantly reduce exercise overhead.

**Virtual Leader Effects Trainer (VLET).** While CCTT provides virtual simulation training for mounted forces, VLET combines high-fidelity dismounted leader trainers with PC-based reconfigurable vehicle simulators to support leader development and the training of IBCT squads/crews, platoons, companies/troops, and infantry battalions/RST&A squadrons. The system will provide full-spectrum training to IBCT maneuver and maneuver support units. Initial VLET distribution will support each IBCT as well as the Armor and Infantry Centers.

**Synthetic Environment Core (SE Core).** The development and integration of a Synthetic Core (SE Core) technology

supports the development and fielding of the Army's virtual simulation program required by the Legacy, Interim, and Objective Forces. SE Core extends and expands the capability of the common virtual environment created by the interoperability of the current Close Combat Tactical Trainer (CCTT), the Aviation Combined Arms Tactical Trainer —Aviation Reconfigurable Manned Simulator (AVCATT-A), the Virtual Leader Effects Trainer (VLET), and the proposed solution for the Objective Force (Embedded Combined Arm Tactical Trainer (CATT)) to enable a common virtual environment. The SE Core acquisition strategy reduces the cost of developing and fielding stand-alone simulators by coordinating the development of system and non-system training requirements. The SE Core approach leverages the reusable hardware and software of the common virtual environment and merges the development of system and non-system simulation systems by establishing a framework for designating funding and acquisition responsibilities between the Training Mission Area (TMA) and the appropriate system Program Executive Officer (PEO) and Program Managers (PMs). The Objective Force XXI training system will feature a robust SE Core that integrates live, virtual, and constructive simulations. SE Core will provide commanders the ability to simultaneously train all battlefield operating systems, in real time, on the virtual terrain of choice, and under all operating conditions demanded of a force projection Army conducting military operations in a joint environment. SE Core will also enable combat, materiel, and force developers and analytic communities to test, evaluate, and refine new doctrine, weapons systems, and organizations in compressed time schedules, prior to "bending metal." SE Core will provide the common architecture and framework for the CATT program, i.e., linked armored/mechanized, aviation, air defense, fire support, engineer and virtual leader effects simulators. The adoption of SE Core as the Army's common virtual environment and infrastructure for the current and future CATT family to support Army Transformation will promote interoperability of virtual systems and ensure the most cost effective use of funds through maximum reuse of software, hardware, and infrastructure by reducing the time and money it takes to incrementally field separate CATT systems.

**Fixed Tactical Internet (FTI).** FTI allows digital units to conduct live training without having support from signal units every time a unit with digital equipment conducts field training. Lower FTI provides capabilities for FBCB2 equipped units to conduct training (battalion and lower). Upper FTI will allow battalion and higher units to conduct digital training in a live environment without having to deploy dedicated signal units.

**Digital Multi-Purpose Range Complex Objective Instrumentation System and Targets.** DMPRC-OIS provides new and modern ranges capable of training, testing and stressing today's Soldiers and their modern equipment with a realistic train-as-you-fight environment, using all available combat systems capabilities, and digitally integrating those systems to manage all forces undergoing individual and collective live-fire training and qualification.

**Integrated Military Operations on Urbanized Terrain Training System (IMTS).** IMTS provides a melding of three separate but similar thrust efforts into a combined umbrella program. These programs are the transition Military Operations in Urban Terrain (MOUT) sites, the Combined Arms MOUT Task Force training sites, and other MOUT facilities programs. The program will reduce acquisition and sustainment costs, leverage technologies and acquisitions, solve complex and common problems, foster Horizontal Technology Integration (HTI) through commonalties and standards, synchronize and integrate the collective efforts of the Common Training Instrumentation Architecture (CTIA) by leveraging near term requirements, and support the objectives of the Urban Operations Training Strategy.

**Common Training Instrumentation Architecture (CTIA).** CTIA is the Army's common training instrumentation architecture that is the underlining architecture for the homestation, CTC and deployed digital training instrumentation system across the Live Training Product lines (i.e. CTC—Objective Instrumentation System, DMPRC, Homestation and Instrumentation Training System, MOUT, One Tactical Engagement Simulation System), allowing for the seamless integration of constructive (One Semi-Automated Forces/WARSIM) and virtual simulations (Close Combat Tactical Trainer) into live digital training events. It provides the linkages and integration with Army operational C4ISR systems and architectures with Army training instrumentation systems. It provides the baseline training architecture for embedded training capability in the Objective Force.

**One Tactical Engagement Simulation System (OneTESS).** OneTESS provides a live environment tactical engagement simulation system that replicates weapon effects of combat systems in the conduct of collective training. It will provide the architecture for future systems to maximize embedded training capability within weapon systems; supports precision live combined arms force-on-force and force-on-target training exercises at Brigade and below at Homestation, Combat Training Centers, and deployed sites; and is compliant with the Common Training Instrumentation Architecture.

**Homestation and Instrumentation Training System (HITS) Phase II.** Hits Phase II is being reevaluated for an accelerated fielding. The HITS ORD is expected February 2002. HITS provides the capability to simultaneously support multiple training exercises for homestation and deployed forces. It provides objective data collection of unit performance (in force-on-force (FOF), force-on-target (FOT), live fire, and associated command post exercises). HITS supports CATS training and exercise events. HITS integrates live training with other simulation environments to provide representative training across battlefield functions and collate AAR materials from varied training support/simulation systems to provide a cohesive AAR package for associated training elements.

**Intelligence Electronic Warfare Tactical Proficiency Trainer (IEWTPT).** IEWTPT provides realistic Battle

Command training through an intelligence information environment. IEWTPT will be embedded in or strapped on individual MI tactical collection systems. It will provide training from the operator/crew level through the corps Military Intelligence battle staff.

**Forward Observer Exercise Trainer (FOXS).** FOXS provides quality training for MOS 13F skill levels 1-4, as well as a common task trainer for all Soldiers. The system will be High Level Architecture (HLA) interoperable and will operate in a stand-alone mode to train from one to thirty students in an institutional training environment. FOXS will operate at the unit level to train FOs without the use of live ammunition. It will be interoperable with other Combined Arms Tactical Trainers locally and via long haul networks. It will monitor performance and provide feedback in accordance with the Army AAR process.

## Nonsystem TADSS that Support the Combat Training Center (CTC) Domain

**Army Battle Command System (ABCS)-Integration.** Enables CTC Instrumentation System to collect digital data to prepare the AAR. This program is critical in providing a bridge between the legacy and objective instrumentation systems. It enables the CTC legacy instrumentation systems to collect digital data for the preparation of AARs for ABCS-equipped units. One half of the Army's divisions will be so equipped by the end of FY06.

**National Training Center Objective Instrumentation System (NTC-OIS).** This system replaces aging components. It is CTIA based and One TESS compliant and provides digital functionality. Serves as basis for Joint Readiness Training Center and Combat Maneuver Training Center systems. Fielding is in FY06.

**Combat Maneuver Objective Instrumentation System (CMTC-OIS).** Replaces aging components. CTIA based and One TESS compliant. Provides digital functionality. Failure to fund will result in lack of a replacement system for CMTC instrumentation system which reaches wear-out in FY08.

**Joint Readiness Training Center Objective Instrumentation System (JRTC-OIS).** Replaces aging components. CTIA based and One TESS Compliant. Provides digital functionality. This is the replacement system for JRTC instrumentation system, which reaches wear-out in FY10.

**Military Operations in Urban Terrain Objective Instrumentation System (MOUT OIS).** Allows instrumented feedback to units for AARs. CTIA based and One TESS compliant, MOUT OIS interfaces with NTC, CMTC, and JRTC Objective Instrumentation Systems. Provides digital functionality.

**Combat Maneuver Training Center Range Data Measurement Subsystem (CMTC RDMS).** Equipment/software to collect and transfer real-time data and control commands from player unit, Simulated Area Weapons Effects/Multiple-Integrated Laser Engagement System I (SAWE/MILES II), to Core Instrumentation Subsystem (CIS)

and back. Data includes position location, weapon engagement, SAWE/NBC effects, etc.

**OPFOR Surrogate Tank Vehicle (OSTV)/OPFOR Surrogate Vehicle (OSV).** Both are based on M113A3 chassis with visual modifications to include an OSV turret that is driven by Bradley Fighting Vehicle components. Excess M60 thermal sights are utilized. (The OSTV replaces M551 Sheridans and M60 tanks used as surrogate tanks and the OSV replaces M551s and M113s used as surrogate BMPs.

**OPFOR Combat Wheels.** Change in operational environment reduces number of combat tracked vehicles, but increases wheeled systems. This system results in an ability to institute operational environment changes, which reflect changing real world conditions and provide full spectrum capability.

**OPFOR Aviation.** Provides OPFOR rotary wing aviation and Unmanned Aerial Vehicles (UAV). UH-1s are aging, near wear out, and scheduled to leave the inventory in FY04. There is no UAV program for OPFOR. This system will result in an inability to institute operational environment changes to reflect changing real world conditions and provide full spectrum capability.

**National Training Center (NTC) Range Data Measurement Subsystem (RDMS).** This system is composed of equipment and software to collect and transfer real-time data and control commands from player unit (SAWE/MILES II) to CIS and back. Data includes position location, weapon engagement, SAWE/NBC effects, etc. NTC Range Data Measuring System life cycle ends in FY04. Must be replaced prior to NTC OIS in FY06.

**Combat Maneuver Training Center Observer Controller System (CMTC OCCS).** Replaces Observer Controller SABER and SINGARS radios with Commercial Off the Shelf System. Makes 171 additional frequencies available for rotational units. This system enhances the CTMC's ability to assess unit performance in AARs and the unit's ability to use tactical radio systems in an operationally correct manner in the secure mode.

**CMTC Single Channel Ground and Airborne Radio System(SINGARS).** Provides infrastructure upgrades to SINGARS radio system used to monitor tactical units to provide input for AARs. Increases efficiency of radio network and frees frequencies for use by tactical units.

**CMTC Live Fire (Interim).** Provides an interim live fire instrumentation system for CMTC until the fielding of CMTC OIS in FY08. Currently, CMTC does not have an instrumented live fire capability.

**CMTC MOUT Instrumentation Video.** Provides a limited instrumented AAR capability for CMTC MOUT until the fielding of CMTC OIS in FY08.

## CTC MCA Projects

**National Training Center (NTC) MOUT Combined Arms Collective Training Facility.** To support the contemporary operational environment, NTC requires a MOUT site of sufficient size to support combined arms brigade-level operations.

**NTC "Star Wars" Building.** NTC will require a new Training Analysis Facility to house their new objective instrumentation system.

**Battle Command Training Program (BCTP) Seminar Facility.** With the demolition of Bell Hall in FY05, BCTP loses their Seminar Facility.

**National Training Center Expansion.** The National Training Center at Fort Irwin provides realistic battlegrounds for training brigades to meet the challenges of the 21st Century. In the 20 years that NTC has been in operation, the speed and power of weaponry have increased significantly, requiring larger training areas, even while the military is losing training lands due to land restrictions or development. Therefore, the House Armed Services Committee conferees expanded the NTC by adding over 110,000 acres of open maneuver space in a manner that recognizes the Army's critical training needs as well as the needs of the environment. The Departments of Defense and Interior will look at a variety of conservation measures, such as acquisition of private and state lands; construction of barriers, fences, and other structures; and funding of research studies, to ensure compliance with the Endangered Species Act. The NTC Instrumentation System, to include Observer Controller Communications, will require expansion. Additional Military Construction projects are required and cost estimates will have to be developed.

## Nonsystem TADSS that Support the Institution Domain

**Satellite Communication (SATCOM) Principals Transformation Trainer (SPTT).** SPTT provides a Defense SATCOM training device to meet or exceed U.S. Army Signal School as well as the Objective Force Communication Training requirement. It provides training to operators and maintainers in Military Occupational Specialty (MOS) 31S on principles of satellite communications and equipment.

**Integrated Training System (ITS) (CSS TADSS).** The ITS is an integrated, comprehensive maintenance training system that contains specific subsystems of part-task trainers, simulation devices, physical mock-ups, static displays, curriculum, and electronic classrooms with Interactive Multimedia Instruction (IMI) products that collectively will meet all current training requirements. ITS is also expandable/adaptable to meet future requirements. ITS provides seamless integrated maintenance training system to train military occupational specialties (MOSs) 63B, 63S, and 63W in the maintenance of both current and future wheeled vehicle systems. It has been designed for simplicity and reliability to provide organizational and direct support level maintenance.

**Basic Electronics Maintenance Trainer (BEMT).** BEMT provides basic electronics training of missile electronics repair and test, measurement and diagnostic equipment repair at Ordnance Missile and Munitions Center and School, Redstone Arsenal, and electronics maintenance repairer training at the Ordnance Electronic Maintenance Training Department at Ft. Gordon.

**Advanced Morse Mission Trainer (AMMT).** AMMT provides training for MOS 98H, Air Force, Navy and Marine Corps Morse intercept operators. AMMT will emulate the common remote system to support multi-mode collection training.

**Basic Morse Mission Trainer (BMMT).** BMMT provides training for MOS 98H, Air Force, Navy and Marine Corps Morse intercept operators.

**Model Bridges.** The Family of Model Bridges and Terrain Boards (FMBTB) provides complete scale models with removable bridge components that will provide a visual aid to students prior to actually erecting a full size bridge at a training site. Terrain boards will replicate, to scale, Major Training Areas (MTA), such as NTC and CMTC.

In addition, TRADOC has developed an Institutional Digital Education Plan (IDEP) to integrate ABCS training throughout all TRADOC centers and schools to support and sustain the U.S. Army's digitization strategy with appropriately trained Soldiers and leaders. The IDEP describes the intent for transition from the current interim New Equipment Training Team/ Central Technical Support Facility-based training system into the long-term solution: the TRADOC institutional training system. It identifies a digital training model and defines the categories of ABCS training appropriate for integration into TRADOC institutions through resident and distance learning applications, defines the anticipated end-state for the training system, and a transition plan to reach the objective system.

## Conclusion

As world order, operational environment, character of military actions, and unit capabilities change, Army training must remain relevant. As the Army "transforms," so must training. The Army must train Soldiers and units for situations and missions they will face tomorrow. The Army must provide leaders, Soldiers, and units tough, realistic, multi-echeloned, and fully integrated training that will produce bold, innovative leaders to deal with complex situations, flexible Soldiers with the warrior ethos, and well-trained units. Soldiers of the 21st Century will be expected to achieve these results across the full spectrum of operations. The nature of future threats demands that the Army place its highest priority on training the nation's Soldiers.

# Appendix 4: Army Distance Learning

Distance Learning (DL) is defined in AR 350-1 (draft) as the delivery of training to Soldiers and units through the application of multiple means and technology. The amount and kind of training appropriate for distance learning application will be determined by the tasks to be trained. DL allows students, leaders, and units centralized access to essential information and training. It represents a powerful capability in which the proper balance of course content and delivery technologies are provided when and where they will have the greatest impact on force readiness.

## Description

The Army Distance Learning Program (TADLP) is a Department of the Army

program that was approved for implementation in 1996. TADLP is funded in FY98-FY10 to field DL classrooms and convert TRADOC courses to DL delivery media. The mission of TADLP is to improve training, enhance force readiness and support Army Transformation by exploiting current and emerging technologies in facilitating life-long learning and the development of self-aware and adaptive leaders through the delivery of the right training and education to the right Soldier and leader at the right time and place.

## Documents

TRADOC Regulation (TR) 350-70 has been changed to better describe the DL training development process. Once finalized, the revised AR 350-1 will provide policies for Army DL. Interim guidance for student, course, and lesson management is contained in a policy message issued by the Department of the Army (DA) Deputy Chief of Staff for Operations and Plans (DCSOPS) in March 2001, Subject: Implementation of the Army Distance Learning Program. The TADLP Campaign Plan contains the requirements, policies, and management tasks to ensure the program's support of Army readiness. This Campaign Plan supports Army Transformation and digitization. It develops and leverages linkages between Army, other Service, and Department of Defense (DoD) programs to provide common training materials to Soldiers, leaders, and units. This assures access to training anywhere, anytime through the use of common technologies.

In May 2001 The Army senior leadership established a General Officer Steering Committee (GOSC) for the purpose of providing advice and recommendations on all Army DL programs and initiatives to assure The Army's investment in DL provides the intended impact on force readiness and well-being. In the near term, the focus of the GOSC is to develop strategy in support of Army Transformation, identify intermediate and objective states for TADLP, and identify and leverage complementary linkages between existing programs.

The Army program supports Executive Order 13111, "Using Technology to Improve Training Opportunities for Federal Government Employees," 12 January 1999, and the DoD Advanced Distributed Learning (ADL) Initiative.
The Army's program coordinates and integrates multiple programs and initiatives in areas where commonality exists while maintaining the uniqueness of each program. Currently, the major programs and initiatives being reviewed and assessed by the GOSC are TADLP, Distributed Training Technology Project (DTTP), Computer Based Training (CBT), Reserve Education and Learning (REAL), Army Continuing Education System (ACES), and Army University Access Online (eArmyU).

Additionally, numerous other programs are facilitating training opportunities for individuals and units via distance means. Examples include the Army War College Distance Education Program, The Reimer Digital Library, The Army Correspondence Course Program On-line, the Center for Lessons Learned Virtual library, and unit training courses.

TADLP is an approved Army Acquisition Program while the Army National Guard (ARNG) DTTP is a congressionally directed assistance program with an acquisition component. TADLP and DTTP complement each other but have different missions and objectives. TADLP focuses on military readiness training for Active and Reserve Component forces. The DTTP supports and extends TADLP while also supporting multiple ARNG missions to include military readiness training. The essential difference between the programs is that DTTP features a nationwide ARNG telecommunications Infrastructure (GuardNet XXI) designed to deliver voice, video, and simulation traffic to the National Guard in a multi-secure, robust, managed and reliable network.

TADLP and DTTP take the schoolhouse to DL centers in units, students in their homes, and Soldiers anywhere in the world, on-line or on-the-job. The essential components of TADLP are DL courseware, Digital Training Facilities (DTF), deployed training, and DL expansion of the Combat Training Centers (CTC).

The infrastructure for Army DL is a non-developmental initiative that leverages existing infrastructure and commercial off-the-shelf hardware to the greatest extent possible. The Defense Information Systems Agency (DISA) communications infrastructure is the primary source of network connectivity for the Active Army and USAR. GuardNet XXI, already in place, provides the communications infrastructure for all ARNG interstate telecommunications. These are supplemented by Internet, national commercial networks and satellite capability where approved.

Under the guidance of the TRADOC Program Integration Officer for TADLP (TPIO TADLP), approximately 850 TADLP and ARNG DTTP DTFs are programmed to serve training and self-development needs of the AC and RC. Soldiers can train at dispersed facilities such as ARNG armories, USAR Centers, Combat Training Centers, Classroom XXI facilities, their homes, deployed units, home station, and colleges and universities. The objective for DTF is to put 95% of all Soldiers within 50 miles of a classroom by FY06. As of December 2001, 434 of 850 Active, USAR, and ARNG DTTP DTFs have been fielded, resulting in 82% coverage of the Army.

## The Classroom XXI Program (CRXXI)

Although separate from TADLP, CRXXI provides training modernization that enhances the TADLP DTF at Army resident schools. This program improves training provided through the schools and allows the broadcast of training to remote TADLP/DTTP DTFs deployed through Distributed Training Technology. In addition, CRXXI establishes Army standards for courseware development and playback, instructional technology capabilities that are Soldier centered, and design and architectural standards for classrooms. CRXXI is scheduled for completion by end FY09 with a total of 270 digital classrooms fielded.

## Deployed Training

The Program Manager for TADLP fields DTFs that provide mission readiness,

professional development, sustainment, and lessons learned training to deployed units. There are eight deployable training facilities in Germany, Bosnia, Kosovo, Hungary, and the Sinai. Three courses, Hazardous Material (HAZMAT), Basic NCO Course (BNCOC), and Battle Staff NCO Course (BSNCOC), have been presented using these deployable facilities.

## Courseware

Courseware is being redesigned, where appropriate, to include DL training phases/modules in multimedia format as the link between the Soldier and schoolhouse. Course media will include CBT, simulations, video teletraining (VTT), audio-conferencing, e-mail, chat rooms and videos. CBT includes CD-ROM and web-based training in both synchronous and asynchronous modes. Since the thousands of Army courses far exceed the resources available to accomplish their redesign for DL delivery, TRADOC, working with the other major Army commands (MACOM), has implemented a course selection and prioritization process. Under the current plan, over 575 courses will be redesigned for DL delivery by FY10. There are currently 92 courses (plus 73 currently under development) with DL phases listed in The Army Training Requirements and Resources System (ATRRS). As the system of record for Army training requirements, ATRRS is now capable of capturing DL training requirements, managing sites and student throughput, making reservations, and receiving student progress updates on DL courses posted by TRADOC and other training MACOM.

Over 414 functional and leadership courses are being redesigned into the Army Training System (TATS) courses to ensure that all components will train to a single standard. These courses provide a pool from which DL courses are created. The Army is programmed to redesign course content for DL delivery at the rate of 31 courses per year through FY02 and 47 per year through FY10. End state will be over 500 courses redesigned. Selection of courses for DL redesign is based on Army readiness requirements. In coordination with the Army Staff and MACOM, the master course list is reviewed and prioritized annually by TRADOC. Additionally, CBT offers over 1600, web-based information technology courses free of charge to the Army work force.

## Conclusion

The end state goal for Army DL is to provide the right quality training and education to the right Soldier and leader at the right time and place. The way ahead as envisioned by the DL GOSC encompasses four concomitant actions: 1) Define the future strategy to train and educate all Army personnel. 2) Define the current inventory of automation equipment intended for delivery of DL content and identify the required optimal architecture. 3) Halt inefficient legacy work; maximize efficiencies; tie into Army Knowledge on Line; speed up implementation. 4) Develop metrics for DL, return on investment, and the overall investment in DL.

# Annex D: Installations

## Introduction/Overview

Army installations must support the people, equipment, training and doctrine of the Army. They must be operationally capable of supporting the development and training of the Interim and Objective Forces, and recapitalization of the Legacy Force. New and more efficient management techniques, facilities modernization and services/construction in support of Army Transformation are necessary. Installations are strategic assets: power projection platforms serving to enhance deployment of the force and support deployed formations. Reach-back links using strategic communications, by relying on enhanced command and control capabilities, facilitate mission accomplishment of a modernized force and must be supported by Army installations. Installations with operational forces will be optimized to support a rapid transition from garrison operations to force deployment. Installations must reshape and modernize to keep pace with changes in force structure, training, doctrine, technology and the security impacts of the changing world environment. Installations must support families so our Soldiers can deploy knowing that their family members' well-being is assured.

Transformation and modernization will change the face of our installations and communities. Transformed units will be significantly different from the combat, combat support and combat service support units of today. Changes in these units will impact facility requirements including housing, training facilities and training areas, maintenance and logistical support facilities to support modernized and recapitalized Army equipment, and facilities supporting the well-being of Soldiers and their families. In the recent past we have already seen some changes. Barracks went from multiple Soldier rooms with gang-type latrines to the current 1+1 Department of Defense (DoD) standard. Family housing evolved from small, stand alone, utilitarian units to larger, community-based units built and managed by private contractors. Training areas and ranges are evolving from stand alone, single use, ranges to complexes that support individual and unit level collective training simultaneously in live and virtual environments. While the specific future aspects and requirements of many changes are still being defined, the Army will continue to develop new programs for our installations as these emerging concepts are finalized.

What follows are Army installation initiatives that support Army Transformation and modernization. These initiatives seek to support modernization of the Army by ensuring readiness at our Installations.

## People

The Army is first and foremost people. Soldiers, their families, and civilian employees are the Army. The installation initiatives that directly support our people include the Residential Community Initiative and the Barracks Modernization Program. These programs facilitate readiness by ensuring the continued well-

being of the Soldier, his family, and our civilian employees.

## Barracks Modernization Program

This initiative is targeted directly at improving readiness and retention through the improvement of our single Soldiers' quality of life. The standard for new barracks is the Department of Defense 1+1 construction standard. Korea, the only exception, has a waiver to construct to a modified 2+2 standard. Under the 1+1 standard two Soldiers are assigned to a module containing two living/sleeping rooms with a shared common bath and kitchen-type service area. Non-commissioned officers (NCOs) are entitled to an entire module. Unlike other Services, the Army's approach to barracks modernization is to build brigade or equivalent size complexes. Brigade complexes include barracks, Soldier community buildings, company operations facilities, battalion and brigade headquarters and dining facilities. The Army is committed to completing the program by 2008.

The program represents a significant long-term commitment to improve living conditions of single Soldiers. The Army will invest a total of $9.5 billion over the entire program and $5.7 billion (including host nation support) between FY02 and FY08. Military Construction Army (MCA) provides the majority of funds, augmented by OMA (Barracks Upgrade Program (BUP)) and supplemented by Congressionally added Quality of Life Enhancement, Defense (QOLE,D) funds. By the end of FY01, the Army has funded approximately 70% of permanent party barracks to the 1+1 standard or equivalent.

The Army is committed to improving housing for single Soldiers and to completing its permanent party barracks modernization program by FY08. The current program buys out all barracks worldwide by FY08. Based on necessary changes for Army Transformation, the arms rooms and company operations facilities designs will be modified to accommodate requirements for additional space and Soldier population in each brigade complex.

## Residential Community Initiative (RCI)

The Residential Communities Initiative (RCI) is the Army's innovative program that improves military family housing while demonstrating our commitment to families. This initiative emphasizes a critical Army goal to enhance the quality of life for Soldiers and their families by creating and sustaining attractive, affordable residential communities on Army installations. RCI supports the readiness of Soldiers by ensuring his family is properly housed and cared for. Under RCI, the Army establishes long-term business relationships with world-class private developers to design, maintain, renovate, construct, and operate all family housing on selected posts. The partners will arrange for project financing from private investors, hire and manage the contractors, and provide ongoing services such as maintenance and repair. RCI is designed to meet the needs and lifestyles of today's Army families ranging from townhouses to detached single homes. The housing communities will have a distinct

architectural theme according to installation location and modern interior layouts. Communities will include varied amenities such as parks, running trails, green areas, playgrounds, swimming pools, and more.

The Army has implemented the RCI program at four installations: Fort Carson, CO; Fort Hood, TX.; Fort Lewis, WA.; and Fort Meade, MD. More than 13,000 existing family houses will be renovated or replaced at these locations, in addition to building new houses to help meet each installation's deficit.

The Army plans to execute 20 additional RCI privatization projects by FY04. These projects bring the total program to over 61,000 sets of quarters in the United States. The Army is committed to developing quality homes and residential communities to support our Soldiers and their families. Additional information on the Army's Residential Communities Initiative may be found on the RCI website at http://www.rci.army.mil.

## Units/Installation

Installations support the units that execute the Army's responsibilities for our National Defense. Readiness at the unit and installation level is critical to success. The Army Facility Strategy, Utilities Systems Privatization, The Facilities Reduction Program, Enhanced Use Leasing, and Morale, Welfare, and Recreation Public Private Ventures directly support unit and installation readiness. These initiatives seek to improve facilities used by Soldiers and units. They increase the installations efficiency in their core competencies, and save specific installations money in operating and maintenance costs. Each of these initiatives seeks to improve the installations ability to support unit and Army readiness.

## Army Facility Strategy (AFS)

The Army Facility Strategy (AFS) is a program to bring the Army to an overall C-2 Facility condition by modernizing selected facilities to C-1 within a 20-year plan beginning in FY04. This initiative is directed at unit and installation readiness to ensure installations have the facilities they need and that the funding for sustainment of both new and existing facilities is included. The selected facilities for improvement within the program are based on the facility condition as evaluated against standards in the Installation Status Report (ISR). Building upon the success of the Barracks and Strategic Mobility buy-out programs, the AFS requires continuing the level of restoration and modernization funding to tackle the most critical facilities issues of the Army. Key to the success of the AFS is full funding of the minimum annual sustainment of real property to halt further deterioration and properly maintain the facilities we are restoring and modernizing. Initial facility types include in AFS are Vehicle Maintenance Facilities (and supporting hardstand requirements), classrooms, fitness centers, chapels, trainee barracks, Reserve Centers and National Guard Readiness Centers.

During the FY03-07 Plan, significant gains were made in funding sustainment. Sustainment is now at approximately 95% of our requirements across this planning period. The AFS still seeks 100% sustainment funding by FY05. Also during

the FY03-07 planning process, approximately 49% of the requested AFS restoration and modernization requirement was funded. AFS site visits have been conducted at seven sites world-wide.

In the future the Army will continue to seek full funding of the AFS restoration and modernization requirement during the FY04-09 planning period.

## Utility Systems Privatization (USP)

Privatization is the transfer of ownership, operation and maintenance, and improvement of Army utility plants and systems to companies in the private sector. Privatization is a better way of doing business and an opportunity for the Army to divest itself of non-core functions. Privatization will result in reliable, safe, efficient, and environmentally compliant utility services for our installations. This initiative provides installation commanders an opportunity to directly focus on mission and mission support core-functions.

By the end of FY01, the Army privatized 21 systems and exempted 28 because privatization was not economical. The goal is to privatize all electric, natural gas, water, and wastewater systems by 30 September 2003 unless privatization is not economical or the systems must be retained for security reasons. The Army has 320 utilities systems in the United States that will be privatized. The remaining 271 systems are being evaluated or are in the procurement process.

## Facilities Reduction Program (FRP)

Facilities reduction saves sustainment dollars that installations can use more efficiently for other, more critical, facilities. Defense Reform Initiative Directive (DRID) #36 – "Disposal/Demolition of Excess Structures" requires the Army to eliminate 53.2 million square feet (MSF) of unneeded facilities by FY03. Success of the Facility Reduction Program (FRP) is critical to continued readiness.

During FY02 and FY03 the Army must dispose of an additional 13 MSF. MACOM allocation of FY02-03 FRP dollars is based on MACOM performance and the relative amount of excess in each MACOM. Our ultimate goal is to reduce excess in each MACOM to 15% or less. The facility reduction program is centralized in FY02/03.

Victory will be declared after FY03. Future requirements for FY04 and beyond are limited to demolition associated with military construction. Enhanced use leasing opportunities will be explored with remaining excess facilities.

## Enhanced Use Leasing

Leasing has long been a useful component of the Army's approach to reducing base operating costs so installations can focus on their core competencies and mission readiness. Over the past 40 years the Army used its leasing authority in the limited fashion dictated by law. In a bold move to improve business processes the DoD drafted new language that revamped the leasing process to make it more flexible

giving a greater share of leasing proceeds directly back to the installations. The Army is now taking advantage of this new legislation.

One current example is at Fort Sam Houston. In June 2001, the Army signed a lease with a private company to rent and renovate historic Brooke Medical Center. This lease is estimated to provide the Army with over $250 million in rent revenue over the next 50 years while preserving a significant historic building.

Enhanced use leasing will assist in reducing infrastructure costs, provide much needed new facilities, and upgrade existing services as well as adding new ones. Installations can potentially find additional funds resulting from lease revenues that may be used for readiness, modernization, and quality of life initiatives. Enhanced use leasing will directly impact installations readiness by improving efficiency and effectiveness.

## Morale, Welfare, and Recreation (MWR) Public Private Ventures (PPV)

The Public-Private Venture program is the Army's alternate means of delivering MWR facilities and services. It is a commander's program to assist in providing MWR services to Soldiers and families. Commanders can maximize underutilized real estate and leverage these assets to benefit the overall MWR mission on the installation. Through PPV partnerships, commanders can deliver state of the art facilities to meet the needs of today's Soldiers while maintaining focus on the core installation mission. The U.S. Army Community and Family Support Center (USACFSC) is the designated agency that negotiates and awards PPV contracts for all MWR projects. The PPV program objective entails pursuing private developers to finance, design, construct, operate, and maintain MWR facilities over the life of the land lease. There is no non-appropriated fund (NAF) or appropriated fund (APF) capital outlay needed for PPV construction projects, and no APF requirement for maintenance and repair. Installations negotiate with the private partner on profit sharing to receive a supplemental revenue stream geared to support other MWR services and programs for Soldiers and their families.

Five PPV contracts have been awarded resulting in a NAF capital avoidance of approximately $32.2 million. To date, the PPV projects have infused over $65,000 into the installation MWR fund.

The Army's goal is to pursue developers for 11 other ongoing PPVs with an estimated NAF capital avoidance of approximately $53 million.

## Army-Wide

The preceding installation initiatives support overall Army readiness by ensuring the people, units and installations are more efficient and effective. At the Army level Efficient Facilities Initiatives, Army Environmental Stewardship, and Competitive Sourcing seek to increase the Army's readiness through savings of operations and maintenance costs. Each addresses our command-level responsibilities to the environment, our Soldiers, and their families. These initiatives support readiness by ensuring that Soldiers and

installations can focus on their primary duties and responsibilities to train and provide support.

## Base Realignment and Closure (BRAC)

Base Realignment and Closure (BRAC) is an integral part of the Army's ability to reshape infrastructure to match changing missions and requirements to support readiness and mobilization requirements.

Congress authorized a new round of BRAC in FY05. This provides the opportunity to co-locate Army organizations, improve efficiencies and generate significant savings to improve the overall level of Army readiness.

The Army, with an aggregate excess capacity currently estimated at 20-25%, would benefit by further reshaping its overall infrastructure. Prudent management requires disposing of infrastructure that is excess to the Army's needs.

## Army Environmental Stewardship

Army Environmental Stewardship is driven by support for readiness and sustainability, and not merely compliance with environmental laws and regulations.

The Army's highest priority is to maintain readiness. Sound environmental stewardship enables the Army to train as we fight. Conservation of natural resources on installations ensures continued access to training and testing lands. Effective management of hazardous materials and the protection of air, land, and water resources prevent fines and delays that constrain installation management.

Sustaining installations requires new policies and priorities. The Army is developing polices for managing unexploded ordnance (UXO) on Army ranges to ensure their use indefinitely. Socio-environmental issues such as noise are now being cast under the rubric of sustainability and encroachment. In such direct support of installation missions these issues are getting higher visibility and priority.

Modernization is a continuous process essential to maintaining the Army's ability to respond to America's security needs now and in the future. The Army is taking the opportunity to minimize life cycle costs through systematic planning and design, pollution prevention, and environmentally sustainable acquisition processes. When determining requirements, equipment and material life cycle management is essential to achieve environmental success.

Environmental analyses are and will be prepared at several levels to support Transformation. The purpose of these analyses is to ensure the Army makes the best decisions with regard to current and future environmental risks and costs.

## Competitive Sourcing

Continued success in modernizing and transforming the Army requires our support infrastructure to be as agile, efficient and effective as our warfighters. When applicable competitive sourcing of installation services, and maintenance

and repair activities offers the potential for improved performance, increased responsiveness to commanders and Soldiers, better access to new technology, and lower costs. It enables the Army to make the best use of available resources to meet national security objectives and focus on mission requirements.

The Army has performed public-private competitions in accordance with OMB Circular A-76 of significant portions of installation services, facilities maintenance and repair activities, and information management functions. Since FY97 this initiative has saved the Army $146.9 million on 8,749 spaces studied. This allows us to efficiently focus on core competencies and mission requirements and improves our overall readiness.

The Army continues to depend upon the success of the OMB A-76 program to find efficiencies for funding readiness and modernization.

## Summary/Conclusion

Army installations will transform and modernize with the Army. Installations will modernize and operate in concert with the development of the Interim and, Objective Force while still supporting the Legacy Force. The Army initiatives discussed above address people, units and installations, and the Army as a whole. They support modernization and Transformation on Army installations and prepare us for a future marked by an ever uncertain and changing strategic environment.

These initiatives, as well as previous modernization actions on Army installations, will allow us to effectively transform the Army. As new concepts and doctrine continue to emerge, existing programs will transform to support the Army and new programs will be developed to better support modernization.

We must focus on the changes necessary to adapt our installations to new missions, new technologies, and new living and working environments. The many challenges the Army faces in the 21st Century require bold and innovative solutions. The Army is dedicated to meeting these challenges by providing quality, mission ready, installations for our Soldiers to live, work, and train.

# Annex E: Personnel

## Introduction

As America's land force, the Army's delivery platform is "boots on the ground." Only Soldiers can occupy territory, as is often required to avert war or to enforce peace terms after hostilities cease. The essence of the Army's capabilities is not planes, ships, or weapon systems, but its personnel. Therefore, having the right quality and quantity of personnel (whether military, civilian, or contractor) is vital to continued Army readiness and modernization. Moreover, the Army needs modern, web-enabled tools to manage the force in a way that is responsive to today's environment.

While winning the war against terrorism is the current focus, the Secretary of the Army and Chief of Staff have emphasized that an equal priority is to position the Army to win the next war by entirely transforming from a Cold War orientation. The Army personnel community has focused on seven specific areas to support Army Transformation: (1) The Personnel Transformation initiative, introduced in August 2000, will streamline and webify personnel business processes across all Army components; (2) Civilian Personnel Management initiatives will improve management support for civilians and overcome workforce shortfalls anticipated over the next 10 years due to retirements; (3) Manning objectives will shape and train the force for transformation to the Objective Force; (4) Scientific studies that address selection, classification, recruiting, and retention of Soldiers; (5) MANPRINT, which analyzes man-machine interface, will ensure the Army does not procure weapons and equipment that exceeds the Army's ability to provide operators of sufficient quality and quantity; (6) The Army Development System will completely overhaul the Officer, Warrant Officer, Enlisted and Civilian management systems; (7) Army Well-Being initiatives will help balance the work life of Soldiers, civilians, and their families to improve morale, readiness and retention. To fulfill these responsibilities, the personnel community will not only exploit advanced technologies, but will also adjust its structure and programs as needed. Army's personnel footprint and sustainment requirements will be reduced where possible through split basing of re-capitalized personnel structure and greater use of technology to provide reach-back capability.

## Personnel Transformation

One objective of Personnel Transformation is to create a full spectrum personnel support system that meets the demands and expectations of the Army's Objective Force. This full spectrum personnel support system will be knowledge based, sophisticated but simple-to-use, real time, 24/7 accessible, and responsive to the commander and Soldier. The Army personnel community has made exciting progress and continues to seize opportunities to achieve Personnel Transformation objectives. For example, the Army is in the forefront of the Defense Department's effort to develop the Congressionally-mandated Defense Integrated Military

Human Resources System (DIMHRS). DIMHRS will provide an unclassified single, integrated military personnel and pay management system for all Department of Defense (DoD) military personnel during peace, war, and mobilization/demobilization. In an effort to fuse this DoD endeavor with its ongoing personnel transformation initiatives, the Army has volunteered to be the first Service to field DIMHRS. The projected initial operating capability of DIMHRS for the Army is FY 2004. DIMHRS is a great fit, as it helps to meet many Army personnel transformation objectives. In the meantime, the personnel community, leveraging available technology, continues to implement improvements to enhance capability, prepare customers for change, and position the personnel systems for transition to DIMHRS. The Army has made significant progress during the past year through a number of key initiatives. Much of this progress has been achieved without external funding, but in most cases can only continue with additional resources.

Army Personnel Transformation initiatives are partnered with the Army Knowledge Management (AKM) initiative. AKM is a comprehensive strategy developed by the Army Chief Information Officer to cover both the Active and Reserve Components. It will manage the information technology infrastructure as an enterprise, in line with the Global Information Grid (GIG), with a view toward reducing the footprint and creating ubiquitous access. Access to personnel systems and services will be through Army Knowledge Online (AKO) as the enterprise portal. Army Knowledge Management is a strategic transformer for the Army and is a key component of Army Transformation and Personnel Transformation. The following initiatives support both Personnel Transformation and AKM goals:

## Integrated Total Army Personnel Data Base (ITAPDB)

Building an Army-wide corporate personnel database is key to Personnel Transformation. In response to partial mobilization and recent world events, the ITAPDB program office is focusing its near term efforts on providing a read only, single integrated and authoritative source for Army personnel information on Active Army, Army National Guard, and Army Reserve personnel. In this initial form, ITAPDB will not be a transactional database as originally planned, but will draw data from legacy systems and applications. Although the database will not be real time, it will be refreshed on a schedule necessary to meet operational mission requirements. The ultimate accuracy of the data will be dependent on data feeds from our existing major personnel systems. This database will apply business rules to eliminate redundancy and improve accountability and visibility, in keeping with the "single authoritative record concept." This database will be made accessible to users through the use of commercially acquired software products that operate in a web-based environment. This database is scheduled to be delivered by the end of the 4$^{th}$ Quarter FY 2002.

## Army Human Resource Systems of Systems Architecture Database (SOSA)

SOSA provides an accountability of personnel systems, applications, extracts, and databases maintained within the Army personnel community. It is the single centralized personnel management information tool that tracks detailed information on the inventory of Army personnel systems and their interfaces. This tool is used to focus the individual personnel system transformations toward a network centric organization in support of Personnel Transformation and Army Transformation. All personnel systems are required to register in the SOSA to obtain HQDA funding. It is a living document that portrays a current view of the DCSPER's "as is" personnel information systems architecture. It contains vital system information such as personnel systems description; functional proponents' administrative information (name, address, telephone number etc.); listing of system interfaces; Human Resource (HR) Management Model; HR Activity Hierarchy Diagram; "as is" Information Architecture Diagram; and other important functional and system information. This repository of information is accessible via the internet (http://www.armyhr.hoffman.army.mil) with a preapproved passwords.

## Strength Management System Redesign (SMSR)

SMSR, already underway, will design and build a new Army strength analysis and forecasting system for the ODCSPER and all its stakeholders. The current strength management models consist of four loosely integrated models, which incorporate 1970 and 80's based technology. This multi-year effort will incrementally deliver a series of integrated, redesigned models to replace the current suite. The new models (collectively known as the A2SF) will use the latest algorithms, processors, databases, and telecommunications to form a state-of-the-art strength management and forecasting system. This system will increase flexibility in modeling manpower policies and programs; simplify operator efforts and provide greater accessibility though web-based technology; project strength levels within a half percent two years out; provide 50 percent faster personnel program development time; reduce legacy system Operation and Maintenance costs by a half million dollars per year; validate, cleanse, and process personnel data from the ITAPDB; and update forecasting methodologies and mathematical models.

## Official Military Personnel File (OMPF) On-Line

On 15 November 2001, for the first time in Army History, active duty Soldiers were able to view their OMPF directly without the intervention or need of personnel staff. This Soldier empowerment tool was made possible through a knowledge-based web application created by the personnel community called OMPF On-Line. Tested successfully at Fort Lewis and in Korea, access to OMPF was given to all active duty Sergeants First Class in the zone for promotion to Master Sergeant in the February 2002 Promotion Board. Using OMPF On-Line, Soldiers in the zone could, at anytime day or night,

view and verify their evaluation reports, commendations and awards, training and education, and administrative data in a read-only mode through the Army Knowledge Online (AKO) portal. This capability will be incrementally phased in to the remainder of the NCO Corps, Officer Corps and Reserve Components by July 2002. Internal funding was reallocated from legacy systems to resource this personnel system breakthrough. Long-term possibilities are significant, to include Soldiers being able to not only view but also update their personnel data at battalion level, thus reducing a significant portion of the personnel service support footprint.

## Field-to-File

The companion to OMPF On-Line that will further enhance personnel service support while reducing footprint is a prototype called "Field to File." Again, at the battalion level, bypassing layers of previously needed personnel staff, Soldiers will be able to directly update their OMPF. Imagine the quality of customer service available when Soldiers can review their OMPF from a laptop in Bosnia on Monday, provide their personnel administrator copies of missing documents to transmit electronically for filing in their OMPF, and verify that the documents were correctly filed in the OMPF on Tuesday. The first phase of this prototype development involves using digital senders to transmit official documents from Soldiers directly to their OMPF at the Enlisted Records and Evaluation Center (EREC). This prototype will not only reduce personnel support but also save time and postal costs. Through resources made available from the logistics community, this prototype has been successfully tested at Fort Lewis and in Korea. Funding is critical to the progress of the program's second phase, which includes the capability of sending documents without the need of digital hardware. Again, the long-term implications are staggering in terms of reduced personnel staff requirements, but even more significant in data accuracy and responsiveness for both Active and Reserve Components.

## My2Xcitizen

During FY 2001, the Army Reserve Personnel Command (AR-PERSCOM) launched a new website, http://www.2xCitizen.usar.army.mil, that allows continuous expansion of information and Soldier services to members of the Army Reserve. The most recent improvement to the website is a self-service portal that provides Army Reserve Soldiers with comprehensive access to view, download, and, in some cases, update their critical personal data. The new portal, 'My2xCitizen', provides the Soldier with an integrated secure Army knowledge Online (AKO) login; a view of his or her Official Military Personnel File (OMPF); various retention and readiness information to include status of their security clearance, physical, expiration term of service (ETS) and other important dates; view only access to retirement points records and other retirement information; and alerts that flag key expiration dates pertaining to their career. In addition, the Soldier can update contact information, volunteer for current operations, and customize windows and components for personal use and preferences. Planned future enhancements include upgraded integration with AKO; the incorporation of

"field-to-file" efforts currently ongoing at the Enlisted Records and Evaluation Center (EREC); a promotion consideration information module; and the addition of a Mandatory Removal Date (MRD) calculator. The new portal represents one of many initiatives AR-PERSCOM has taken to provide Soldiers with tools to better manage their careers.

## Super Server

The Total Army Personnel Command (PERSCOM) is in the process of fielding a web interface interim solution to enhance the accuracy, timeliness, and synchronization of Active Army personnel data. The Super Server project provides a browser interface for the Active Army's current field level personnel accounting and strength reporting system, Standard Installation Division Personnel System – 3 (SIDPERS-3). It also reduces the current number of SIDPERS-3 servers from 3,600 to 45. By eliminating intermediate servers and internal transaction processing, Super Server will stabilize and improve data synchronization, reduce errors, and improve accuracy. Units involved in the testing of this initiative enthusiastically welcome its improvements. Fielding is in progress and completion is anticipated by late January 2002.

## SIDPERS-3 Migration

Pending funding, the Army plans to substantially migrate the Active Army out of SIDPERS-3 by FY 2003. The migration is intended to serve several purposes: to enhance the field's ability to do strength accounting via a web application; to simplify and eliminate redundant business processes; to prepare the field for revolutionary change anticipated with DIHMRS; and to mitigate any risk of delay in the scheduled fielding of DIMHRS**.** The first step in this strategy was to trim existing SIDPERS-3 functionality, turning instead to functionality already performed more successfully by other legacy system platforms and by deleting unneeded SIDPERS processes. In November 2001 approximately 50 percent of the SIDPERS-3 functionality was turned off or transferred to another system.

## Army Selection Board Process

The Army Selection Board System (ASBS) is the Army's solution for HQDA centralized selection boards that will provide electronic access to personnel records, official photographs, and automated management of board processes. The existing board support systems will be responsible for determining eligible candidates and managing board results. The ASBS will fulfill the centralized board function by constructing electronic board files, validating the contents of the electronic files, and presenting the files to voters for scoring. An interface between the existing board support systems and the ASBS will be necessary to electronically pass candidates files back and forth. ASBS will be developed, tested, and fully deployed in a phased approach at DA PERSCOM for the Active Army, AR-PERSCOM for the Army Reserves and the NGB for the National Guard.

## Army University Access Online (AUAO)/eArmyU

This award winning online program expands opportunities for Soldiers to attend college while serving on active duty. It offers Soldiers the opportunity to earn degrees anytime, anywhere at no personal cost, by covering tuition, books and fees, plus providing a laptop computer, printer and internet service account. Initially fielded at Fort Campbell, Fort Hood, and Fort Benning in January 2001, eArmyU now serves over 10,000 Soldiers. The e-learning portal provides single web-site access to degree programs at 23 different academic institutions with course delivery, library use, tutoring, and administrative services. Continued fielding, contingent on funding, is planned for eight additional installations in 2002 with Army-wide fielding envisioned in 2003. For all practical purposes, eArmyU is fielded worldwide, since original participants have already transferred to other assignments worldwide. For years the Army has offered a robust education program to Soldiers. Now eArmyU expands education availability to those Soldiers who, for whatever reason, have not been able to enroll in traditional, scheduled classroom programs. Through eArmyU, Soldiers have an on-line capability to earn a degree without regard to duty hours, deployment schedule, or family issues.

## Assignment Satisfaction Key (ASK)

The Assignment Satisfaction Key (ASK) is a new web application that provides Active Component Soldiers, for the first time, the capability to post assignment preference information directly to the Total Army Personnel Database (TAPDB). ASK was initially fielded in October 2001 and is available through PERSCOM's Website at http://www.perscom.army.mil. Soldiers gain access through their Army Knowledge Online account password. The implementation of ASK culminates a five-year project to improve communications between enlisted managers and Soldiers. Information pamphlets on ASK will be sent to installations for dissemination to Active Army Soldiers.

## Personnel Transformation Challenges

The Army's has over one million military personnel geographically dispersed across seven continents. Soldiers are continually moving both geographically and between components of the Army, entering and exiting the Army, and requiring frequent personnel services. Modern technology has facilitated the Army becoming operationally mobile, geographically dispersed, and fast moving. But the evolution of Army personnel systems has not kept pace with web-based personnel technology. As a result, the Army currently relies on five separate databases and over a thousand different systems to manage the force. These databases and systems use different data standards and protocols, making modernization and integration difficult and expensive. Integration of the five databases into one, coherent, interactive system is critical. Such an integrated personnel database will allow accurate tracking of Soldiers from

mobilization to the battlefield and back, managing sensitive casualty information in a media rich environment, and measuring the operations tempo of the individual.

Objective Force Soldiers will train for a more complex warfight. As a result, there will be an ever-increasing need for higher quality recruits. The Army will be in sustained competition with industry for identifying and recruiting quality people with an aptitude for high-tech skills. After initial training high-tech skills, these Soldiers must sustain current skills and develop new skills needed to stay current with rapidly changing technology. As these highly skilled Soldiers reach decision points on whether to continue their careers in the Army, competition will remain keen from the civilian job market, where opportunities abound for their qualifications.

Increased security concerns provide additional challenges in providing readily accessible information to leaders, while protecting the privacy of the individuals served by the personnel community. Security concerns put multiple demands on our human resources assets, draining our units, leaders and Soldiers of valuable time and energy once applied to other areas of mission accomplishment. Recent added demands of Homeland Defense further stress the Army's ability to fund efforts like quality of life programs for Soldiers and their families, as well as personnel research and development and personnel systems improvements for Personnel Transformation.

The Army personnel community continues to improve data quality, reduce redundant manual input of common data elements, and eliminate manpower intensive manual analysis of information. These improvements will be complemented by efficiencies realized from business process redesign, leveraging web technology, building an Army-wide personnel database, conducting data cleansing, and preparing for a multi-component, DoD pay and personnel systems. All these efforts are designed to improve strategic responsiveness, enable Army Transformation, enhance personnel services reach-back, thus reducing personnel staff on the battlefield.

## Civilian Personnel

High quality, diverse, well-trained civilians are a vital link to Army readiness and sustainability. The civilian component of the Army's Objective Force must be a solid corps of experienced people who are multi-functional, multi-skilled, adaptable, and ready to provide both base operations and increased direct mission support worldwide. Yet, forecasting model shows that of the Army's current 223,000 civilians, 30 percent will be eligible to retire in 2003. The most dramatic impact will hit critical leader positions, as 67 percent of GS-13s, 83 percent of GS-14s, and 92 percent of GS-15s become retirement eligible. By 2010, 62 percent of today's Army civilians will be eligible to retire, and leader losses will exponentially increase as 91 percent of GS-13s, 98 percent of GS-14s and 99 percent of GS-15s become eligible to retire. Additionally, 3100 critical positions in grades GS-9 through GS-15 must be externally filled during the next five years because resource constraints over the last nine years prohibited filling of intern positions. These 3100 positions involve mission

essential areas of information technology, research and development, and other specialty fields to support tomorrow's Soldier. To deal with these civilian workforce demographics and other Army Transformation factors, Army Civilian Personnel is undergoing its own transformation. Some transformation initiatives are described below:

## Civilian Personnel Management System (CPMS) XXI

Civilian Personnel Management System (CPMS) XXI departs from traditional personnel policies and practices that are historically slow and difficult to change. Two major thrusts of CPMS XXI are the Strategic Army Workforce (SAW) and legislative reform. Automated systems that will replace interim and legacy systems to provide a means of forecasting SAW requirements. The SAW will consist of cohort civilians centrally acquired, retained, and managed as future leaders for the Objective Force. A defining element of the SAW will be mandated mobility, resourced by a type of Trainees, Transients, Holdees and Students (TTHS) account. Legislative changes, will address on-the-spot hiring and broad pay banding, essential to rapidly obtain the civilian force of the future.

## Civilian Leader Development

Recognizing that Army Transformation requires not only adaptive military leaders but also adaptive civilian leaders, the Army Chief of Staff directed that studies by the Army Training and Leader Development Panel should include Army civilian issues. The civilian study is paralleling the military studies' methodology to insure compatibility of recommendations and to foster an integrated team approach to leader development.

## Best Business Practices

In support of the Secretary of the Army's affirmed intent to aggressively pursue and achieve best business practices, Army's civilian personnel community continually analyzes operational costs and effectiveness of its products and services in comparison to industry benchmarks. A marketing study to be completed by September 2002 should result in the redirection of recruiting toward high payoff methods to obtain the best and brightest candidates in technical fields critical to Transformation. Civilian recruitment innovations may include broad use of commercial internet job boards and employee referral bonuses. To compete with the largest private sector employers for the best talent, we must mount a sustained, aggressive recruitment campaign using the same kinds of marketing strategies that they use. As a key investment in the Army's future, we are pursuing a several-fold increase in the modest resources typically devoted to marketing Army civilian careers. A widely recognized, Army-developed system, known as the Civilian Productivity (CIVPRO) System, will provide data to define the future size of the civilian personnel processing functions. Two other Army systems established for workforce planning are the Civilian Forecasting System (CIVFORS) for projecting losses/required replacements and the Workforce Analysis Support System (WASS) for analyzing

requirements and tracking workforce trends. Consistent assessment, measurement and evaluation are the only way to insure smart adherence to the three pillars of the Army Vision: people, readiness and transformation.

## On-Line Civilian Personnel Systems

The Army is in the forefront of initiatives to create a fully automated civilian personnel support system that is web-based, real time and 24/7 accessible for Civilian Personnel Operations Centers (CPOC), Civilian Personnel Advisory Centers (CPAC) managers and employees. Some facets are DoD and Federal-wide in scope. In an effort to continue the full integration of civilians into the overall force, civilian data requirements are being identified and incorporated into the Integrated Total Army Personnel database (ITAPDB) described earlier. A critical step is to centralize information currently residing in 10 regional databases. In a continued thrust to streamline processes and provide more flexibility to managers, the Army's 180,000 civilian job descriptions will be reduced to no more then 15,000, which will be accessible online. A single portal for Army job applications will match job specialties and applicant skills and provide an applicant response system, standard Army-wide job kit, vacancy announcement builder, inventory based recruitment methodologies and electronic referral list. These reengineered job application processes are to be implemented April 2002. Another major initiative is to automate the Army's civilian performance management system, allowing for electronic submissions from development of objectives to processing of all honorary and monetary awards through one medium. Army-wide implementation is scheduled for July 2002. The long-term goal is for all civilian personnel to have access to their Official Personnel Files online. To assist deploying civilians to better understand their benefits, entitlements and procedures while deployed, a civilian mobilization web page is being activated within the Civilian Personnel Online (CPOL) web site. Finally, the Army Benefits Center-Civilian, or ABC-C, now provides a full range of benefits and entitlements service to Army employees world wide through a centralized automated center.

## Manning the Active Force

Through FY 1999, the Active Army used a three-tiered readiness system that aligned units with a specific fill priority - one through three. At that time, 14 percent of the Army was designated as Fill Priority One (100 percent fill), and Fill Priority One did not include any of the Active Army's ten divisions. The Fill Priority One units included special operations, recruiting, nominative joint and DoD elements, and certain training activities. As a result, in September 1999 the average fill of the Active Army's divisions was 96 percent, with over two-thirds of the divisional force below 100 percent fill. In response, in October 1999, the Chief of Staff, Army (CSA) issued manning guidance that changed the personnel distribution paradigm for the Active Army. The CSA's goal was to fill all units to 100 percent at skill and grade over a four-year period from FY 2000 to FY 2003. From the onset, the DCSPER linked certain conditions (enablers) that

would have to be met before full manning would be achievable: re-engineer and reduce the size of the institutional (TDA) Army; continue meeting recruiting and retention missions; reduce the number and size of Army headquarters; reduce the Trainees, Transients, Holdees, and Students (TTHS) account; produce greater throughput from the training base; and grow the Active Army's end strength to a level sufficient to account for the disparity between force requirements and operating strength. This aggressive four-year manning plan focused the energy of the personnel community and forms an integral piece of Army Transformation.

## The Active Army Four-Year Manning Plan

The four-year phased manning plan called for the fill of Active Army divisions and armored cavalry regiments (ACR) to 100 percent by the end of FY 2000. In FY 2001, the plan called for 100 percent fill of the divisions, ACRs, and early deployers. In FY 2002, the plan was to fill the entire warfighting (TOE) Army to 100 percent, and in FY 2003 to fill the remainder of the Army to 100 percent. Setting these goals forced the personnel community to relook every aspect of manning the force, such as recruiting, retention, priority of fill, resourcing, attrition management, minimizing the size of the transient accounts, well-being, and any others that impacted success in reaching the CSA's manning goals. These manning goals gave birth to new programs such as the "Army of One" recruiting campaign, and various new incentive programs. To a large degree, the Army has been able to keep pace with the CSA's manning goals over the past two years, due in large part to the great success in meeting the recruiting and retention missions. However, progress in the remaining enablers has been slow. This lack of progressive action across the remaining spectrum of enablers dictated that prudent adjustments to the manning plan were in order.

For FY 2000, the Army met its goal of manning the Active Army's 10 divisions and 2 ACRs to 100 percent in the aggregate with a fill level of 94 percent by skill and grade. The CSA Manning Guidance for FY 2001 added early deployers to the 100 percent manning goal. In November 2000, the early deployer list approved by the Army Deputy Chief of Staff for Operations (DCSOPS) contained 53,000 authorizations. However, based on subsequent DCSPER analysis, the Army determined that it could only man 34,000 authorizations from the early deployer list during FY 2001 without assuming considerable risk in the 100 percent manning of the divisions and the readiness of the non-prioritized force. By September 2001, the Army successfully met this goal by filling the early deployer units to 100 percent in the aggregate, with a 91 percent MOS and grade-band match.

The original CSA Manning Guidance for FY 2002 called for the Active Army to fill the remaining warfighting (TOE) force to 100 percent in the aggregate. DCSPER analysis indicated that since the Army was unable to make substantial progress on the key enabler actions that were critical to full manning, the Army could not meet the manning plan for FY 2002 without unacceptable risk to the remaining institutional Army. DCSPER analysis indicated the original plan would

double the projected number of Active Army non-mission capable units. Due to this risk, the Army modified its original plan for FY 2002. Instead of filling the remaining warfighting (TOE) force to 100 percent, the Army would move forward by filling the remaining 19,000 authorizations in the 53,000 early deployer list to 100 percent. The projected fill for the remaining non-priority units is 90 percent in the aggregate.

Through extensive analysis, the DCSPER also determined that achieving the final manning goal of all units at 100 percent would require an increase in end-strength of approximately 35,000 without any corresponding increase in force structure. Resolution of this, and the other key enablers, remains the primary challenge to achieving the goals of the original manning plan.

Force structure defines the job positions throughout the Army and thus is the major driver of the Army personnel systems. Force structure constantly changes based on the missions within the Army, and each force structure change creates new positions. Since time is needed to recruit, access, and train solders for these new positions, short notice force structure turbulence, especially in the year of execution, creates "friction" within the Army's personnel systems. From a personnel standpoint, transforming the Army, which involves many short notice force structure changes, will create added friction as the Army strives to man the new force. Thus far, the Army has been very successful in manning a changing organization as evidenced by the first Interim Brigade Combat Team (IBCT) at Fort Lewis during FY 2001. This transformed unit was successfully organized and manned to 100 percent in less than two years. However, due to the short lead-time before required stand-up of the unit, there was a significant impact on personnel turbulence and the readiness of other units. With additional lead-time, the Army expects greater success in manning the second IBCT in FY 2002. Additional future force structure changes for Transformation are programmed for FYs 2003-2006 and, at this time, the Army anticipates being able to grow the force needed to man these changes. The bills created for transformation from FY 2004 to 2006 equate to approximately 5,000 additional personnel authorizations.

## Personnel Research and Development

As the Army transforms to the Objective Force, the Army Research Institute for Behavioral and Social Sciences (ARI) is providing scientific studies that address several personnel issues including selection, classification, recruiting, and retention.

Methods and analytic tools to match the right person with the right job are products of personnel and manpower research. Better behavioral constructs are being developed to measure the adaptability and motivation of Soldiers. These Soldier characteristics will be needed to deal with the increased technological requirements of the transformed Army. Also, in the Objective Force, NCOs will likely experience greater autonomy and responsibility. ARI is developing a battery of psychological tests to improve the Soldier-job match, especially for NCOs assigned as first sergeants, drill sergeants, and recruiters.

In recruiting, ARI has performed research that links the diverse needs and aspirations of different types of potential recruits with approaches to influence their individual career choices. ARI has developed a longitudinal model of occupational choice that encompasses not only the initial recruiting decision, but also factors associated with retention. This model will also accommodate the changing conditions in the Army.

## Payoff to the Army

Small improvements in selection and classification accuracy produce large gains in training effectiveness and job performance. For example, an improvement of four percent in job selection accuracy is estimated to result in cost avoidance and performance gain worth $50 million annually. A very significant benefit of improved selection and classification is reduced personnel attrition. Realizing that a second person must be recruited and trained for every Soldier lost, even the most modest reduction of only one percent in attrition rate saves the Army nearly $8 million annually. In summary, more precisely developed recruiting, selection, classification, and retention "tools," coupled with better understanding of command climate, organizational change and family support factors significantly contributes to a transformed Army suited to the requirements of the Objective Force.

## MANPRINT Program

Tomorrow's battlefield will be a complex environment, filled with new equipment and technologies. Real battlefield effectiveness results from a good match between the people who operate and maintain the equipment and the equipment itself. General Shinseki recognized this relationship when he wrote, "The Soldier remains the centerpiece of our formation."

At the heart of the Army Vision are well-trained Soldiers, using state-of-the-art equipment to win wars. The Army's program to ensure that Soldier issues are key considerations in system design, development, and acquisition is called MANPRINT.

The objectives of MANPRINT are to:

- Optimize both the quantity and quality of the personnel needed for systems,
- Design systems that are easily useable by Soldiers, are safe to operate, cause no unnecessary health problems, and maximize Soldier survivability, and
- Identify training so that it is appropriate for the capabilities of the Soldier and the conditions under which the equipment will be used.

## MANPRINT's Role in Army Transformation

New materiel systems for the Objective Force must not only meet performance requirements, but also meet standards of personnel affordability. If future Army systems need too many operators and maintainers, with too highly specialized skills, where the training is too long and expensive, the Army will have failed in its Transformation. The MANPRINT Program addresses these concerns.

New, advanced technologies will require Soldiers with new skills. The accelerated Transformation schedule requires that preliminary design decisions, made early in the acquisition cycle, be quickly and effectively evaluated by the MANPRINT community. If design errors are not detected and corrected early in the acquisition cycle, adverse consequences and costs will increase over the life-cycle of the system. To improve design decisions, MANPRINT must continually keep project managers up-to-date on new information and MANPRINT guidance. Therefore, the heart of the MANPRINT process is its outreach to program managers and contractors. With education, program managers better understand the MANPRINT process and how MANPRINT contributes to reduced life cycle costs, optimizes total system performance, and enables warfighters to win on the battlefield.

## MANPRINT's Strategic Value to the Army

The development of the Comanche helicopter serves as an example of how MANPRINT improves system performance and reduces overall life-cycle costs. Analysis of MANPRINT issues showed a projected cost avoidance of $3.29 billion over the life cycle of the Comanche.

The savings will result from major design influences in most of the Comanche's systems. For instance, the Comanche is designed for easy maintenance. A portable, intelligent maintenance aid contributes to speedy fault identification and a reduced false parts replacement rate. Accessibility has been eased for most major components, and the engine maintenance tool set was reduced from the typical 100 plus tools to only six. These design features and others reduce the number of maintenance personnel, decrease the cost of maintenance and parts, and greatly improve system availability. Consequently, fewer units are required to accomplish missions. Application of MANPRINT should also prevent a projected 91 fatalities and a significant number of disabling injuries. The Comanche program was the first significant program in which MANPRINT principals were incorporated from the beginning.

The MANPRINT process employs task and functional analyses and modeling to best determine personnel efficiency in operating and maintaining systems. The analyses, matched with the relevant personnel attributes and well-planned training, yield lower manpower requirements per system. Because early design decisions are so critical to life cycle costs, MANPRINT must be employed early in a system's developmental cycle to maximize out-year operational and support savings. The continual improvement in MANPRINT techniques and tools relies on adequate funding of additional Soldier-oriented research and development.

## Army Development System XXI (ADS XXI) Task Force

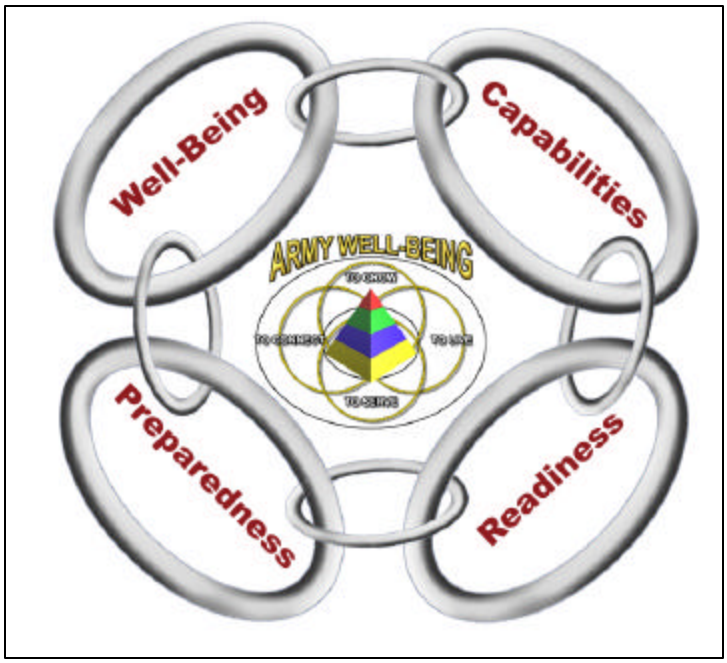
ADS XXI is a key modernization enabler supporting Army transformation and emerging concepts through the systems update process. The genesis of the ADS XXI study was a recommendation in the Manning Task Force final report that Chief of Staff, Army (CSA) chartered in

early 1999 to develop his "Manning the Force" initiative. The Army Development System consists of Officer, Warrant Officer, Enlisted, and Civilian personnel management subsystems. The Officer Personnel Management System (OPMS XXI) was previously evaluated during the 1995-1997 timeframe and the transition continues today, focusing on intermediate level education for field grade officers. A review of civilian training and leader development is in progress. ADS XXI Task Force concentrated on modernizing and transforming the Warrant Officer and Enlisted Personnel Management Systems. The CSA approved 23 initiatives from the year-long study, encompassing 52 discrete recommendations that refine important portions of leader development and personnel management subsystems. These 23 initiatives share two common characteristics: (1) they enhance the ability of our personnel management systems to support the Army's Personnel Transformation by ensuring the eight personnel life cycle functions are efficient and flexible during the Army's transformation to the Objective Force; and (2) they allow for the inevitable personnel management system adjustments that will be generated as the Army's personnel needs evolve during the transformation. Technical training for warrant officers will be modularized and relevant to the gaining unit's equipment or systems. The multi-skilled Soldier concept, the cornerstone of enlisted MOS optimization, revolutionizes a broader way of using Soldiers with specialization occurring at the unit, based on function and supported by assignment-oriented training. Assignment-oriented training will allow the Army to keep pace with rapidly changing technology as the Army moves closer to the Objective Force.

## Army Well-Being

The Chief of Staff's Well-Being initiative, solidified in June 1999, will help support Army Transformation by improving Soldier performance, readiness, recruiting and retention. Well-being is defined as the personal state—physical, material, mental, and spiritual— of Soldiers (Active, Reserve, Guard, Retirees, Veterans), civilians, and their families that contributes to their preparedness to perform and support the Army's mission. The goal is self-reliant Soldiers, civilians, and families, contributing to the Army team. Well-Being programs contribute to Army strength by producing self-reliant individuals who are able to focus on the mission (thus supporting readiness), knowing that their personal lives are in balance and their needs are being met. This in turn creates a strong bond between individuals and the Army directly affecting retention and recruiting.

The inherent responsibility for Well-Being is shared between individuals and leaders. Ultimately, individuals decide how best to ensure their own Well-Being and that of their families. However, the Army should provide an opportunity for individuals in the Army to attain the sense of Well-Being they desire. Well-Being is actually a "condition" resulting from a system of individual programs. As such, Army Well-Being represents the Army's coordinated efforts to integrate policies, programs, and issues into a holistic and systematic framework that supports mission preparedness as well as individual aspirations.




There are five strategic goals for Well-Being:

Goal 1. Implement a comprehensive strategy that integrates Well-Being initiatives, programs, and resources to meet the well-being needs of the Army.

Goal 2. Provide a competitive standard of living for all Soldiers, civilians, and their families.

Goal 3. Provide a unique culture, sense of community, and a record of accomplishment that engenders intense pride and sense of belonging among Soldiers, civilians, and their families.

Goal 4. Provide an environment that allows Soldiers, civilians, and their families to enrich their personal lives by achieving their individual aspirations.

Goal 5. Ensure leadership that maximizes the positive, combined effect of intangibles on the outcomes of Army Well-Being programs and the integrity of the institutional strength of the Army.

Army Well-Being in itself is not a separate and distinct program. Rather it is an effort to synchronize and coordinate the approach to planning and programming existing Well-Being programs. During this analysis, it may be determined certain programs are under funded or do not provide sufficient support to the various constituents. If so, recommended corrective actions will be presented to senior leadership for analysis. The Well-Being Strategic Plan and the Campaign Plan have already been approved and published. This year, the Well-Being Action Plan and the Well-Being Status Report should be finalized and implemented. The Status Report will provide the framework for development of standards, metrics and reporting procedures in order to analyze the effectiveness and appropriate funding levels of Well-Being programs and actions identified within the Well-Being Action Plan.

During FY 2002 the Well-Being program will focus on three major initiatives: (1) finalize the detailed Well-Being Action Plan; (2) develop the prototype Well-Being Status Report, to include linkages to the Strategic Readiness Reporting System; (3) develop, test and implement Well-Being at installation and community levels.

The end state of Well-Being initiatives is an integrated system of Well-Being Programs that does the following:

- Recognizes the Army must foster individual self-reliance and meet the personal needs and aspirations of its people.
- Is designed and resourced to successfully account for the dynamic nature of the Army's operational challenges and America's societal changes.
- Maximizes outcomes such as performance, readiness, retention, and recruiting.
- Contributes to an institutional strength that enables the Army to accomplish its full spectrum mission.

## Conclusion

The Army must continue to man the force with exceptional Soldiers and civilians, sustain the force with efficient and effective management systems, ensure the human dimension is considered in the development of new systems and equipment, and continually monitor and ensure the well-being of all members of the Army family. First and foremost, the Army must support commanders in the field with personnel systems and information that enhance warfighting capability and agility. Complete success in transforming the Army to the Objective Force will only be achieved by taking care of the Army's most valuable asset–it's people. The initiatives of the personnel community target the Army needs from a broad, holistic perspective, and remain focused on "boots on the ground" to achieve the Army's mission.

# Annex F: Force Structure

## Overview

Army force structure provides the Nation with full spectrum land force capability. Army Transformation is designed to enhance capabilities where resident and gain capability where lacking to meet the tenants of *Joint Vision 2020*. This dynamic process drives force structure changes and supports the design of forces to meet the Army's full spectrum of missions.

The Army is comprised of Active Component (AC) and Reserve Component (RC) Soldiers and civilians. In FY02, it is organized into four corps, 18 divisions (ten AC and eight Army National Guard (ARNG)), 15 ARNG enhanced separate brigades, and two ARNG strategic brigades (Figure 1). The Army requires balanced readiness and adequate funding through FY09 for an AC with an end strength of approximately 480,000 Soldiers; a RC with an end strength of approximately 555,000 Soldiers (350,000 ARNG and 205,000 U.S. Army Reserve (USAR)); and a civilian workforce of approximately 215,000 personnel.

## Army Transformation

The Army's Transformation process provides for a strategically responsive force that is dominant across the full spectrum of operations in a joint, interagency, and multinational environment. The Army will continue to modernize and recapitalize selected

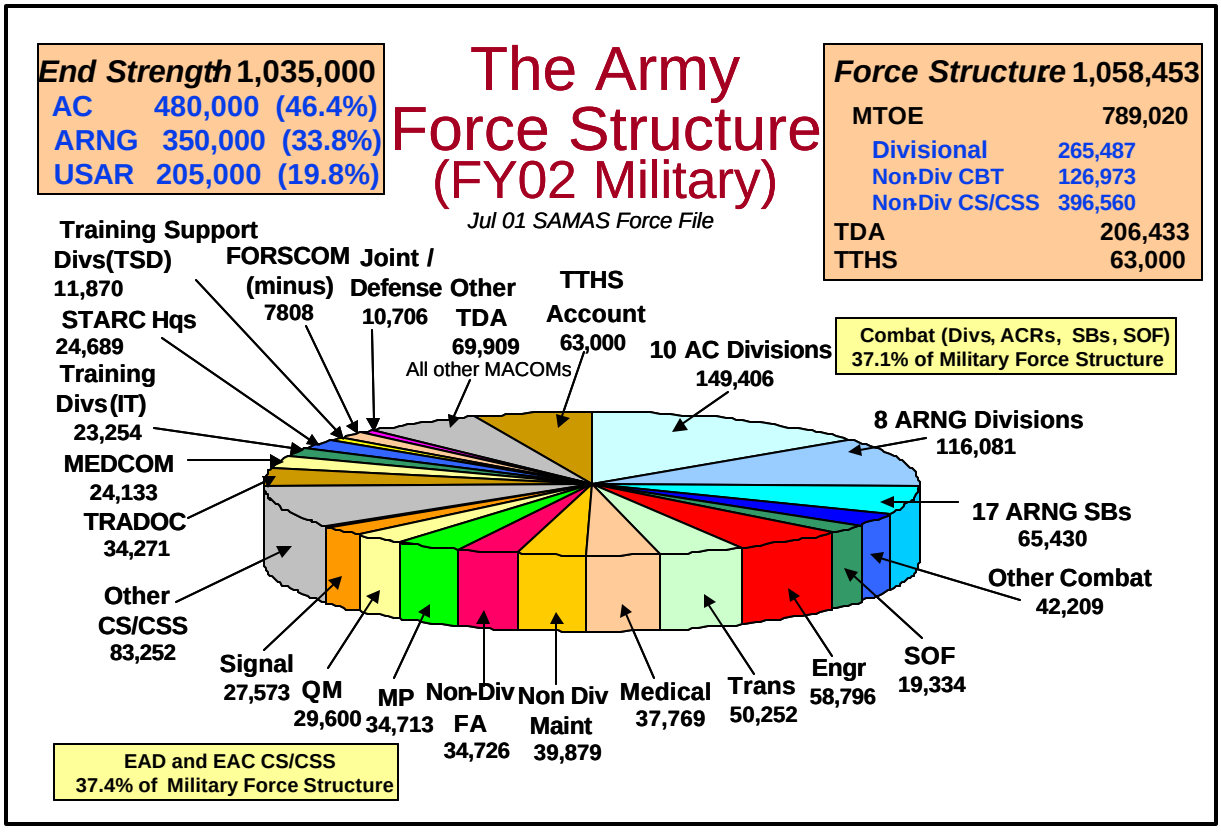



**Figure 1. FY02 Army Military Force Structure**

Legacy Forces to retain significant overmatch capability throughout the Transformation process. Simultaneously, the Army will transform an Interim Force of at least six brigade combat teams that will meet the near-term requirements in support of warfighting CINCs by bridging the gap between our light and heavy legacy forces. During this period, the Army will significantly invest in Science and Technology to acquire the Future Combat Systems (FCS), the centerpiece of the future Objective Force capability.

Throughout Transformation, the Army's **Legacy Forces** will maintain a core force that is recapitalized and fielded with new equipment to increase lethality, situational understanding, and battlefield dominance.

The **Interim Force** is designed to meet the near-term requirements in support of warfighting CINCs. It is essentially the Army's bridge capability to the **Objective Force**. The Interim Brigade Combat Team is a fully mobile, air deployable force that normally fights as part of a division in a joint and/or coalition operation, is able to respond rapidly to crises, and operates effectively in peacekeeping or enforcement operations.

The Army began the Transformation process in early 2000 at Fort Lewis, Washington, with the 3rd Brigade, 2nd Infantry Division, converting to the initial **Interim Brigade Combat Team (IBCT)** design. It completed conversion to the new design with its last subordinate element converting in March 2001. The 3rd Brigade, 2nd Infantry Division will achieve Initial Operating Capability (IOC) by May 2003. The second unit to transform, also at Fort Lewis, is 1st Brigade, 25th Infantry Division. The brigade converts from January 2002 through July 2002. The 1st Brigade, 25th Infantry Division will reach IOC in May 2004.

The Interim Force will consist of at least six IBCTs providing the joint force commander increased operational and tactical versatility to execute fast paced, distributed, non-contiguous operations. The Chief of Staff announced the 172nd Infantry Brigade, the 2nd Armored Cavalry Regiment, the 2nd Brigade 25th Infantry Division and the 56th Brigade 28th Infantry Division (Pennsylvania National Guard) as the next four Interim Brigades.

The Army is developing the organizational and operational concepts for Interim organizations at division through corps level and will refine these concepts as they apply to the Objective Force. The Army's fielding of developing technologies will be fully considered in this process.

Throughout the Transformation process these principles and goals will guide the Army's force structure initiatives in the program years:

- Increase Strategic Responsiveness
- Develop the capability to put combat forces anywhere in the world in 96 hours after liftoff-in brigade combat teams. Build that capability into a momentum that generates a warfighting division on the ground in 120 hours and five divisions in 30 days.
- Improve Operational Jointness

- Develop Leaders for Joint and Coalition Warfighting
- Continue AC/RC Integration
- Man warfighting units first
- Provide well-being of Soldiers, civilians, and families

The characteristics that will make up the Transformation force are: responsive, deployable, agile, versatile, lethal, survivable, and sustainable.

The Army's ability to support the National Military Strategy (NMS) remains central to determining force structure requirements as we plan and execute Army transformation. The Army is leveraging information technology and structuring a totally integrated force sized and shaped to meet worldwide commitments.

## Total Army Analysis and QDR 2001

QDR 2001 (QDR01), completed and published in September 2001, will have a significant impact on the Army's Total Army Analysis 2009 (TAA09). The QDR report provides a new capabilities-based strategy and a new force-planning construct that serve as the basis for TAA09. The QDR01 strategy has four elements designed to give the nation a broad set of capabilities to advance and defend our national interests in both peace and war. The elements of the new strategy are: assuring our allies and friends, dissuading adversaries, deterring aggression and coercion, and decisively defeating any adversary if deterrence fails. The new force-planning construct replaces the QDR97 "2-MTW" construct with (1) Defend the United States, (2) Deter aggression and coercion in forward critical areas, (3) Swiftly defeat aggression in overlapping major conflicts while preserving the option for the President to call for a decisive victory in one of these conflicts (to include the possibility of a regime change or occupation), and (4) Conduct a limited number of small-sale contingency operations. QDR01 also specifically notes a requirement to maintain sufficient force generation capability, as well as a strategic reserve and the need for rotational forces to support small-scale contingency operations.

QDR01 does not change the Army's active or reserve force structure or end strength. It clearly identifies Homeland Security as the highest priority. This will entail a full embracing of the mission and the identification of forces and resources to fulfill the mission. Additionally, a QDR01 directed study will address the roles and missions, forces, and resources for the Reserve Components. QDR01 also strongly supports the Army's Interim and Objective Forces. It emphasizes accelerated development of new operational concepts, organizations, and capabilities as part of Transformation. This includes improving the capability of forward-deployed forces to win rapidly and decisively with minimal reinforcement, enhance strategic responsiveness, and ease the sustainment burden of reinforcing units. However, it also highlights the requirement to "divest ourselves of legacy forces" while we transform. This will maintain, or even increase, current modernization and recapitalization challenges associated with Legacy Forces and capabilities.

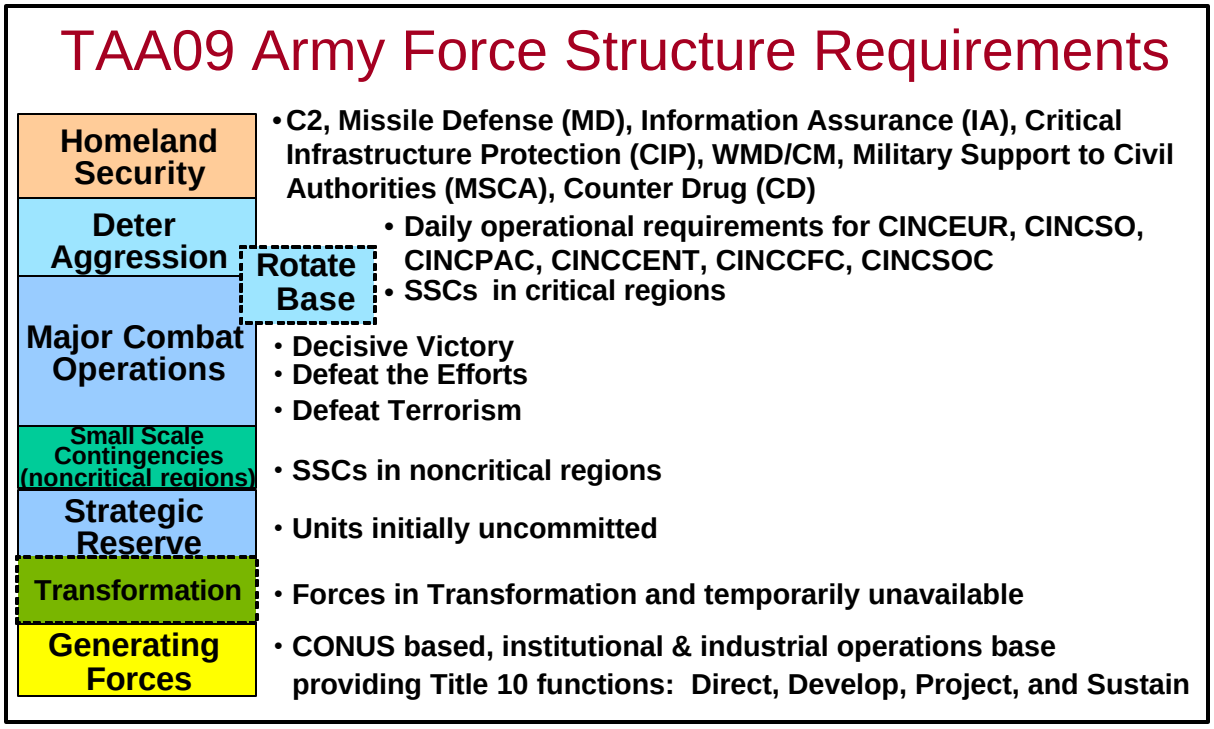



**Figure 2. TAA09 Army Force Structure Requirements**

Given the new strategy presented in QDR01 and associated force-planning construct, Figure 2 represents a graphical depiction of this new construct.

September 11 and the ensuing war on terrorism confirmed the Army was prepared to answer the call. These events are causing the Army to reexamine field commanders' needs, especially in force and homeland protection. Results will be incorporated into Army force prioritization.

## Operating Force Structure

The Army's operating force must be sufficient in both size and capabilities to meet all requirements contained in the NMS to provide the Nation with a full range of options for the international environment, as well as fulfilling CINC Theater Security Cooperation Plans. The operating force must be able to operate across the full spectrum of conflict and remain relevant to winning our Nation's wars—by being responsive, deployable, agile, versatile, lethal, survivable, and sustainable.

The operating force is the warfighting portion of the Army; the force that fights and wins the Nation's wars by providing the combat capability necessary to sustain land dominance.

The operating force accounts for approximately 76% of the Army.

The Army is fully engaged in daily activities supporting the NMS, providing the majority of forces for joint operations. The CINCs routinely employ the Army as their force of choice as a most effective tool in executing theater cooperative security arrangements. Maintaining our overseas presence and cooperative activities promotes regional stability and

gives substance to our security commitments. Additionally the Army serves as a role model for militaries of emerging democracies and promotes internal stability and democratic growth for such nations.

## Generating Forces

Under Title X, the Army's Generating Force has responsibility for providing the management, development, readiness, deployment and sustainment of the Operating Force (Figure 3).

The initial effort to link the Generating Force structure to the Operating Force Structure was incorporated into the Total Army Analysis (TAA) 2007 process. This effort captured the Title X functions and capabilities, as defined in DA PAM 100-1, across the Army's Institutional Base, Industrial Base and Infrastructure. The Army's Generating Force consists of approximately 2400 units and is comprised of the effective combination of military, DA civilian and contract personnel. These units are "linked" to the Operating Force through Command and Control, Logistical/Administrative Support, Occupational Skills and Geographic relationships.

The Generating Force, like the Operating Force, is resourced within programmed end strength. The current strength of the Generating Force is 204,000 military, 217,000 civilian and approximately 197,000 contractor. Since both forces must compete against the same resource pool, management of workforce mix (military, civilian and contractor

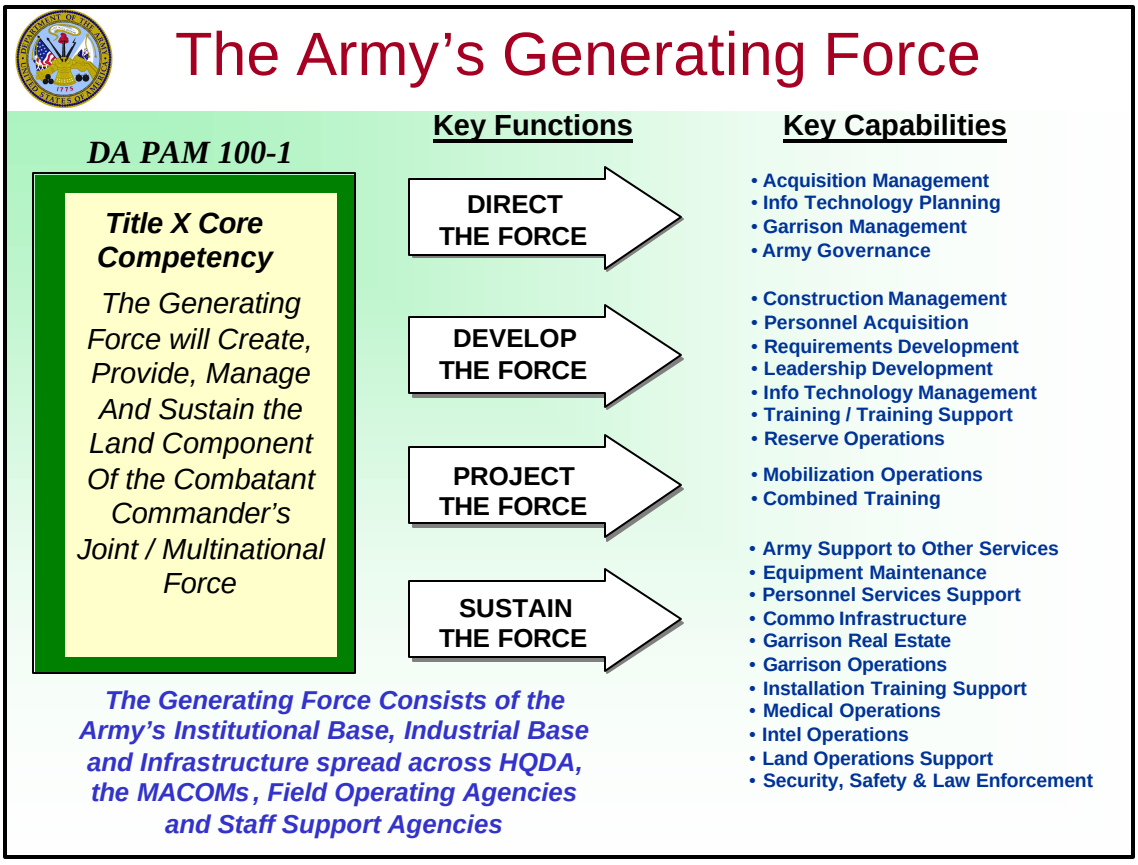



**Figure 3. The Army's Generating Force**

personnel) within the Generating Force is critical. Historically, the Generating Force has used approximately 20% of the military end strength across all three components (24% of AC; 10% of ARNG and 30% of USAR). Beginning with TAA 2007 in 1998, the Army incorporated the Defense Reform Initiatives Directive (DRID) 20 and Federal Activities Initiative Reform (FAIR) Act to improve utilization of the workforce to ensure effective Title X support within manpower constraints.

## Department of the Army Civilian Personnel

Department of the Army Civilians (DAC) are major contributors to the Army's overall mission, comprising approximately 16% of the workforce and occupying vital support positions in all Army operations. More importantly, civilians provide stability and institutional knowledge regardless of the organizational level to which they are assigned, from senior management to administrative support. This is particularly true in the area of depot level maintenance, supply, combat developments, acquisition, training, medical care, research and development, test and evaluation, and facilities operations. The civilian work force is a cornerstone of the Army's CONUS-based, power projection strategy.

The overall tempo of Army operational deployments and mission requirements is ever increasing, yet the civilian work force continues to decline. These reductions are related to CONUS-based outsourcing and privatization efficiencies in base support operations and the reshaping of Army Materiel Command. The final structure of the Army civilian workforce will be affected by the manning recommendations currently under review in support of the Transformation Strategy initiatives. The impacts (additional savings or potential growth) will be assessed in concert with the results of the recent DRID20/Federal Activities Inventory Review (FAIR) Act initiatives and programmed A-76 studies.

## Division XXI and Limited Conversion Division XXI

The Army strives to stay abreast of emerging technologies and implement them to gain efficiencies in both its operating and generating force structures. In the heavy divisions of our operating forces significant change has occurred. This change is known as Division XXI.

Division XXI and the interim step, Limited Conversion Division, are FY99 force structure actions that began to lighten the Army's heavy forces (Figure 4). The objective is to optimize force structure by building on information dominance. It applies the concept of technology "enablers" that add capability to a combat system.

By FY02 these initiatives have already reduced requirements for many of the heavy system platforms in five of the six AC heavy division units, three of the ARNG heavy divisions, and all seven ARNG heavy Separate Brigades. These initiatives not only lighten the Army's heavy forces (reducing the strategic lift requirements for affected divisions by 11%), but also provide systems for "cascading" across the force to improve the overall modernization posture. The actions embedded in the *Army Vision* will further guide how we transform the Army

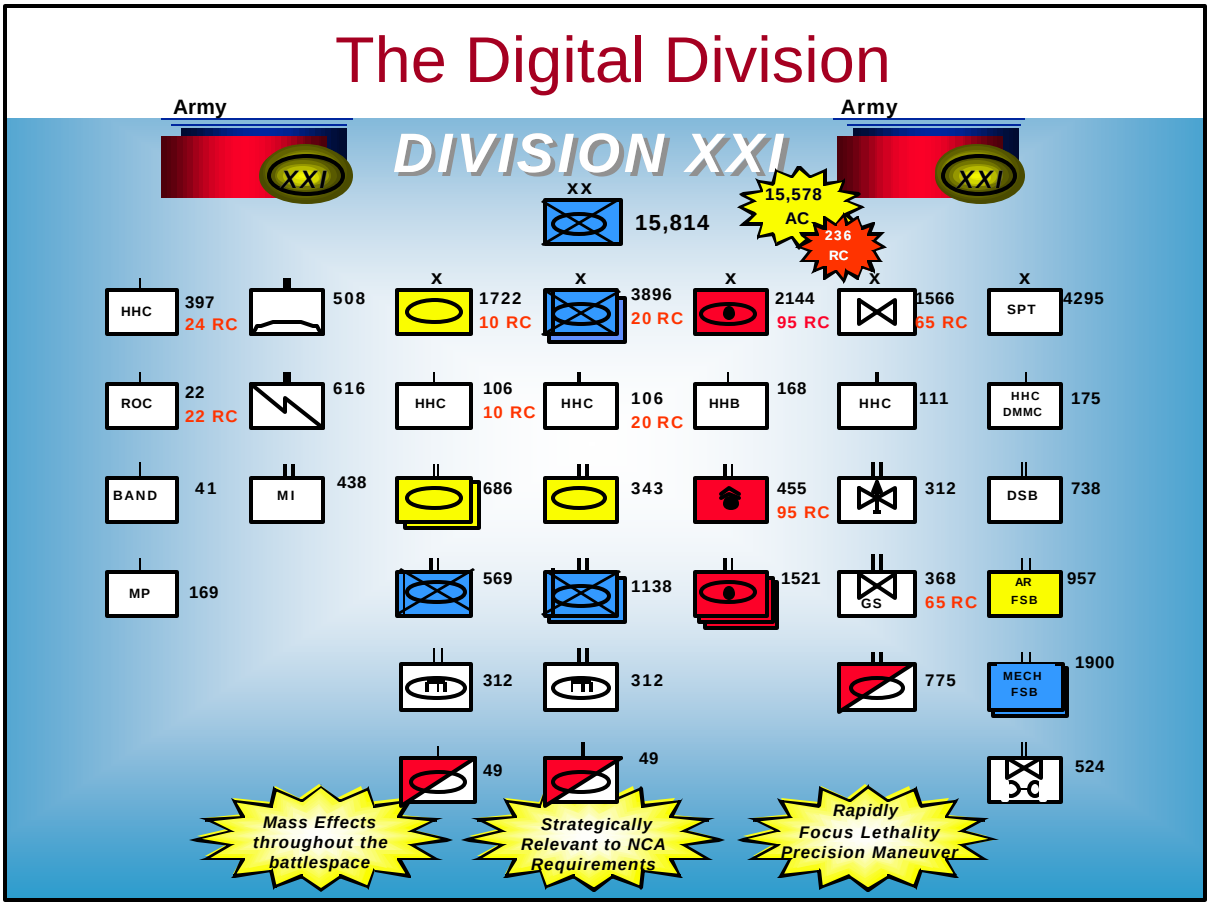



**Figure 4. Division XXI and Limited Conversion Division XXI**

to a more responsive, flexible, and capable force.

## Transformation Brigades

Recognizing the necessity to rapidly provide a full spectrum capable land force to operate in joint, combined, and multinational formations, the U.S. Army will transform its force structure to meet that requirement. The initial Transformation effort focuses on providing brigade-sized forces that will be strategically deployable anywhere in the world within 96 hours to meet a variety of missions; missions ranging from humanitarian assistance, disaster relief, peacekeeping, small scale contingency war to major theater wars (Figure 5). In addition to its strategic deployability, this force will be operationally deployable with every vehicle in the force capable of movement within a theater via C-130 aircraft.

This force will greatly enhance the Army's ability to be dominant at every point of the spectrum, combining technological overmatch with superior quality leadership, people and training to provide warfighting CINCs a land force capable of deterring, containing, stabilizing or decisively terminating a crisis.

Using a mix of available systems and Interim Armored Vehicles (IAV), as they are acquired, two Brigade Combat Teams (BCTs) are formed at Fort Lewis,

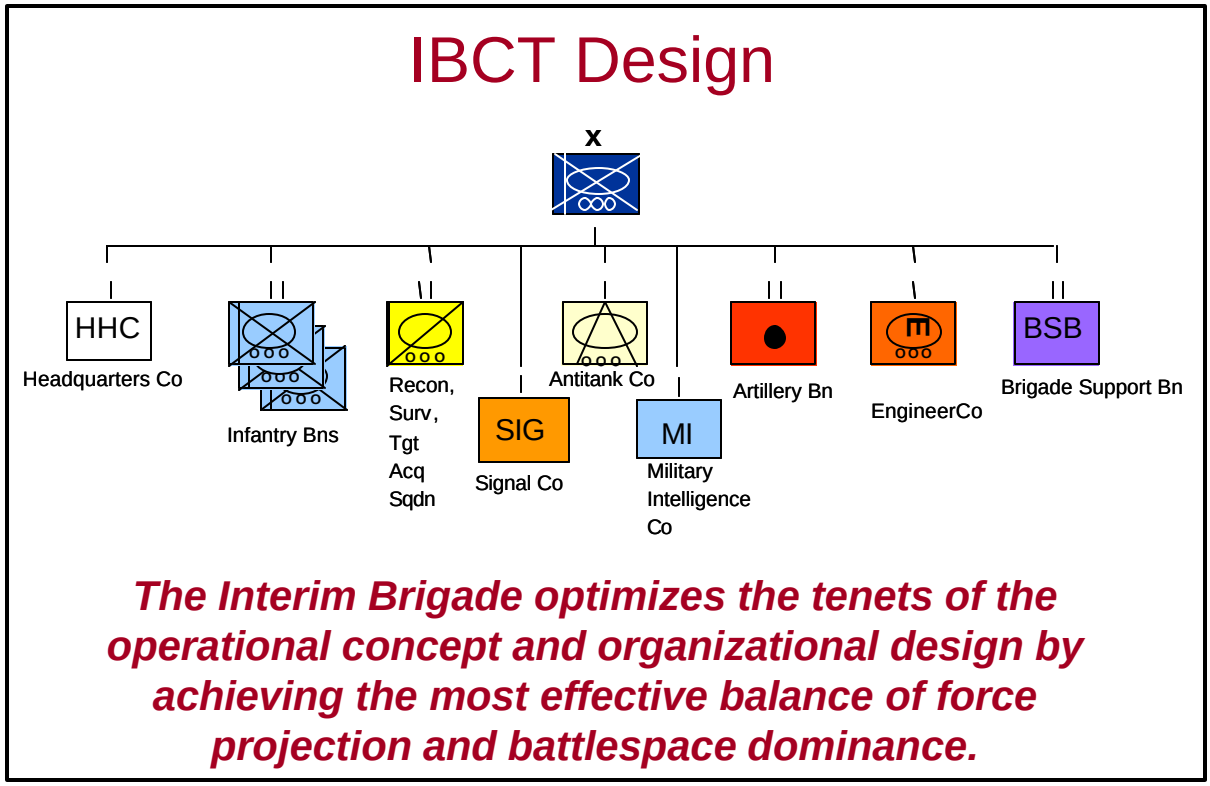



**Figure 5. The IBCT**

Washington to serve as the initial transformation force with this capability. These units will develop the tactics, techniques and procedures required for optimization in small scale contingencies and will also inform Objective Force development.

Force structure transformation will aggressively reduce the deployed logistics footprint and replenishment demand in theater, contributing to the objective force deployability goal (a warfighting division on the ground in 120 hours, and five divisions in 30 days).

## Aviation Transformation

In addition to ground maneuver transformation, the Army is also in the process of transforming its Aviation assets for 21st Century operations. The theme of Aviation Transformation is divestiture of legacy systems to prepare for Objective Force systems. The Army divested all of its AH-1 Cobras in FY01 and plans to divest all UH-1s by FY04. This entails the inactivation of all four corps light utility helicopter battalions and two attack battalions. All of these units are equipped with older airframes. Additionally, the Army is redesigning two of its organic National Guard divisional Aviation brigades to combat support structure. Throughout the remainder of Army Aviation force structure, a general trend is downsizing in order to bring on board more modern capable airframes.

## Medical Reengineering Initiative

The Medical Reengineering Initiative (MRI) reorganizes deployable medical

forces at Corps and Echelon Above Corps. MRI provides support not only to the Interim Force but also provides the transitional pathway for support to the Army Objective Force. The MRI organizational structure provides improved tactical mobility, reduced footprint, and increased modularity for flexible task organization that promotes scalability through easily tailored, capabilities-based, packages. This modular design easily accommodates augmentation packages to permit rapid integration of additional enabling capabilities. MRI also provides the requisite organizational platform for Medical Communications for Combat Casualty Care (MC4). The synergy of MRI and MC4 will fuel Army Transformation in several ways. At objective state, this digitized organization will distribute a common operational picture of patients, medical capabilities, medical supply and medical threats in a non-linear, non-contiguous battlespace. The resultant command and control will provide scalable, seamless, multidisciplinary combat health support for joint, multinational, and interagency operations both within the homeland and around the globe.

## Military Intelligence Theater Transformation

The U.S. Army Intelligence and Security Command (INSCOM) is transitioning its Force Projection Brigades into multicomponent (with USAR) Theater Intelligence Brigades and/or Groups (TIB/TIG) for each theater Army Service Component Command to meet the ground intelligence requirements of each theater CINC.

The TIB/TIG plans, coordinates, manages and executes intelligence and electronic warfare (IEW) operations, all source intelligence analysis, production, collection management and dissemination for the Army Service Component Command and Army Forces in a theater of operations. The TIB/TIG has three missions. First, it provides dedicated long-term/continuous support to the unified or sub-unified command in support of the CINCs' Theater Security Cooperation Plans. Second, the TIB/TIG provides in-theater intelligence for deploying Army Forces (ARFOR). Finally, they have the capability to provide both theater indications and warning support, and intelligence support to counter-terrorism operations.

TIB/TIG force conversion provides dedicated theater-level intelligence assets and enables the Army to be strategically responsive and dominant across the full spectrum of operations by providing advanced indications and warning, a tailored ability to shape the operational environment through continuous engagement and a theater-level intelligence force postured for both contemporary and future operational environments.

## Institutional Redesign (Generating Forces)

The Institutional or Table of Distribution and Allowances (TDA) organizations are the key component of the Generating Force. Redesign of the Institutional Force is an integral part of the overall Army Transformation strategy.

**Institutional Army Reengineering**. The following actions, as a minimum, are key to successfully achieving the Army's Transformation objective:

- Divest nonessential functions, remove unnecessary layering and duplication, consolidate functions, resource in the most cost-effective manner, and privatize/outsource functions where applicable.
- Transform Army Headquarters (Corps through MACOM).
- Reallocate resources supporting core competencies; fully integrate those resources across the Army, other Services, and DoD.
- Reduce acquisition cycles by at least half, anticipating the needs of future organizations; complete major acquisitions within three budget cycles.
- Transform Army test and evaluation by getting involved earlier, using more modeling and simulation, putting Soldiers on the equipment sooner, and conducting appropriate developmental testing to field systems sooner while ensuring they meet mission requirements.
- Create and sustain a customer-focused learning organization that evaluates itself, eliminates obsolete structures, and designs better processes.
- Rapidly create and project an appropriate and capable force to any area of the world.
- Accomplish the reengineered generating force within the Army Vision.

At every level and in all organizations, Soldiers and civilians must aggressively implement current initiatives, as well as generate new reforms to produce efficiencies and, ultimately, savings for the Army. Through reinvestment and recapitalization, these savings will contribute greatly to the goals of providing modernized equipment to the force, reorganizing and preparing trained and ready units, and providing essential quality of life programs. Additionally, the nature of our future power projection Army will demand focused/precise logistics and improved command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR). As called for in *JV 2020*, we will apply quality management principles and the best business practices available to develop and implement focused logistics.

## Reserve Components (RC)

The Reserve Components provide approximately 54% of the total Army strength. The Army force structure goal is to have all active and reserve component elements interchangeable. Nevertheless there are several force structure programs that highlight the Army's Reserve Components.

## Army National Guard Division Redesign Study (ADRS)

As part of the Army's warfighting capability, the ARNG will continue to program 15 enhanced separate brigades and two Special Forces Groups as well

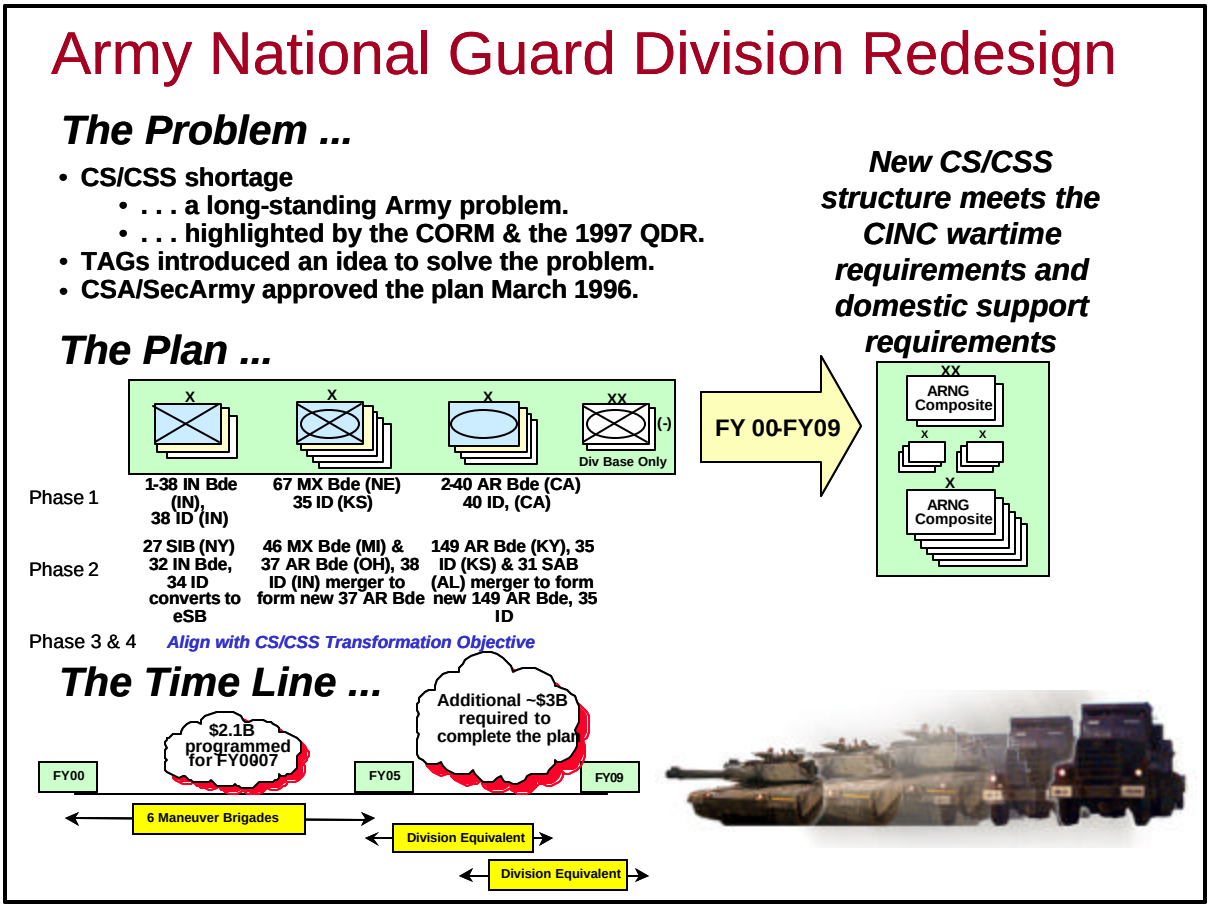



**Figure 6. ADRS Implementation**

as its divisional elements. In addition, the ARNG continues execution of the ARNG Division Redesign Study (ADRS). This concept converts up to 12 ARNG maneuver brigades and slice elements from two divisions to CS / CSS forces required to support the Army's warfighting requirements (Figure 6).

The ARNG Division Redesign Study (ADRS) converts approximately 48,000 of ARNG combat force structure to CS/CSS by FY09. In phases one and two of the implementation plan for ADRS, the ARNG is converting six brigades to resource approximately 20,000 of CS/CSS between FY00-07. The ARNG will convert an additional 28,000 spaces (six brigades and slice elements from two divisions) to complete phases three and four of ADRS. The division and brigade headquarters will be used to form composite command and control headquarters for the CS/CSS structure. Phases three and four decisions are pending results of the CS/CSS transformation initiatives work and development of Objective Force requirements.

Approximately $2 billion is budgeted for FY00-07 to resource the ADRS plan. Additional resources will be applied in future Army Plans to procure necessary resources by FY09 and complete the ADRS conversions by FY11.

## Multicomponent Units

The multicomponent initiative combines personnel from more than one component on a single authorization document. The intent of this initiative is to maximize the integration of AC and RC resources. The initiative does not change a unit's doctrinal requirement for personnel and equipment. No limit has been established for the number of units that may become multicomponent and the concept is available to both active and reserve component units. The ultimate decision for nominating a unit as multicomponent is based on mission requirements, unique component capabilities and limitations, readiness implications, efficiencies to be gained, and the ability and willingness of each component to contribute the necessary resources.

The objective for the Army is to establish multicomponent as a routine part of the Army culture. Candidates will be identified during the biennial TAA process, Command Plan process, or as part of a major Army command initiative. Currently there are 89 nominated and 45 existing multicomponent units in the Army.

## Conclusion

The Army must provide the Nation an array of deployable, agile, versatile, lethal, survivable, and sustainable formations, which are affordable and capable of reversing the conditions of human suffering rapidly and resolving conflicts decisively. To do this, we must design organizational force structures that are interchangeable for different and changing full spectrum environments. We must also equip and train those organizations for effectiveness in any of the missions the Army is charged to perform.

The U.S. Army's force structure must rapidly evolve to best support the NMS and continue meeting the Army's Title 10 responsibilities, while posturing for the challenges of the next generation. The Army's Transformation Strategy provides the means to achieve future success while mitigating current risks.

# Annex G: Space

## General

Successful Transformation to the Objective Force is the key to the Army's ability to sustain battlefield dominance in the 21st Century. This involves meeting the needs of current and future forces. Space-based systems are essential both for intelligence and communications connectivity, as well as other vital functions from navigation to targeting. Today's space capabilities make unique and essential contributions to our land force dominance. Through robust beyond line-of-sight connectivity and their ultimate high-ground perspective, space systems provide warfighters near and real-time situational awareness of force composition and disposition (red and blue), detailed knowledge of battlespace and associated environment, the status of support and sustainment efforts, and the linkages military leaders require to plan, execute, and sustain dynamic military operations.

Achieving the information superiority underpinning of *Joint Vision 2020* (*JV 2020*) and the lighter, faster, more lethal Objective Force will depend, to an even larger extent, upon the modernization of space-based capabilities.

## Army Space Overview

Army space operations have traditionally focused on maximizing space capabilities in support of ground operations and supporting USCINCSPACE in the four space mission areas:

- Force Enhancement
- Space Control
- Space Support
- Force Applications.

**Force Enhancement** is the largest area for Army use of space. It is value added to battlefield functions that helps the land force accomplish its terrestrial mission. As space capabilities and expertise mature, the Army continually upgrades its force enhancement capabilities. Space-enhanced improvements to these functional capabilities are key enablers to the Objective Force and therefore, key elements of Army Space modernization. Force Enhancement capabilities include communications; positioning, navigation and timing; weather, terrain, and environmental monitoring; intelligence, surveillance and reconnaissance (ISR); and missile warning.

As the Army grows more reliant on these enhanced capabilities, our vulnerability is also increasing. Rapid growth in commercial and international space capabilities increases a potential adversary's ability to monitor U.S. forces and potentially negate U.S. advantages in space. **Space control** takes on increased significance for land forces to ensure access to space capabilities. Space control is the means by which space superiority is gained and maintained to assure friendly forces can use the space environment while denying its use to the enemy. The four pillars of

space control the Army uses to retain assured access to space are:

- Surveillance of space—measures to monitor, detect, identify, track, assess, verify, and categorize threats and friendly spacecraft.
- Protection of U.S. and friendly ability to use space active and passive defensive measures to ensure that U.S. and friendly space systems perform as designed despite harsh environment and adversary negation attempts.
- Prevention—measures to preclude adversaries from exploiting U.S. or allied space services.
- Negation—measures against an adversary's space systems and services used for purposes hostile to U.S. national security interests, and supporting battle management, command, control, communications and intelligence.

The Army also plays a role in **space support** by conducting operations to deploy and sustain military and intelligence systems in space. The Army provides significant technology for space and missile system development; participates in joint space forums to articulate Army requirements for space platforms and architectures; and provides highly trained, space skilled members to the NASA astronaut program.

In the far-term, information assurance and anti-access strategy concerns may expand to include an Army role in **force application** from space and the Army's ability to coordinate and control effects of force application from space.

## Space Modernization

The need for modernization of space capabilities to support the Objective Force is clearly explained in the concept for the Objective Force:

*"The strategic landscape, organizations, technology and threats place greater demands on space-based capabilities than ever before. For the Objective Force, long-range communications, missile warning, terrestrial and space weather information, positioning and navigation, intelligence, reconnaissance, and space and terrestrial surveillance increasingly rely on space assets to provide the rapid real time support required by a strategically responsive force. To maximize the full combat capability of sensors and communications, the Objective Force requires linkage from the satellites down to the Soldier on the ground. Space communications provide an opportunity for command and control on the move, including the capability for en route mission planning and the ability to maneuver in compartmented and urban terrain. Space surveillance, reconnaissance, and tracking capabilities help provide the situational awareness to see and understand first—increasing lethality and survivability. Space assets also provide the capability for a smaller deployed footprint with 'reach back' and 'push forward' tailored communications capabilities."*

*"The careful design of space platforms to meet future requirements can also help reduce the design weight of ground systems. In addition, this increasing importance of space has not escaped the attention of our potential adversaries who have also begun examining and fielding ways to exploit space to benefit their aims. This emerging threat requires a capability for space control to deny potential adversaries the ability to see us, target us, and attack us from space. All of these demands make it essential for The Army to aggressively support efforts to improve and increase the space capabilities of the U.S."*

The Army's Investment Strategy for Space is to invest Army resources while influencing like investments by other space stakeholders. Investment objectives are to provide cost-effective, technologically feasible initiatives and research efforts that will enhance the emerging operational capabilities of Army units, meet responsibilities DoD has delegated to the Army, and achieve the Army's Transformation Strategy. While other services and government agencies have primary responsibility for space-based segments, the Army's programmatic emphasis is on space-related ground terminal development and wideband SATCOM payload control operations. To ensure the Army meets its responsibilities to the joint and combined force, and to ensure the Army ground components keep pace with space-based sensors and communications system improvements, a continuing effort to field enhanced tactical and fixed ground-based terminals, receivers, and control systems is necessary. As Army space requirements increase, modernization interests expand to include other segments of space architectures and systems. There are increasing Army efforts to identify and leverage joint, commercial, civil, and allied space opportunities with operational and tactical warfighting potential. The Army is also an active participant in the design of joint and national space systems and architectures through National Security Space Architect (NSSA) orchestrated efforts. Army focus is on helping develop and integrate Army requirements to ensure joint, civil, and national space systems support land force mission needs.

Army space modernization planning takes its lead from the overall Army modernization strategy. The Army's concept and technology development efforts for space are directed at ensuring the necessary full spectrum capabilities will be available for the Objective Force to achieve the characteristics described in the Army Vision and execute the enhanced operational concepts of *JV 2020*. In the near-term, Army space systems are being upgraded to keep pace with user demands for accurate, secure, and timely information for the Legacy and Interim Forces. Preplanned product improvements to Army legacy systems are planned to take advantage of future architectures and spacecraft advances.

## Doctrine

The use of space capabilities is becoming increasingly integrated into Army and joint doctrine. The quote from Field Manual 1 at the beginning of this

annex is indicative of the normalization and integration of space that is taking place throughout the Army. Army Space Policy requires that "the Department of the Army will conduct space and space-related activities that enhance operational support to warfighters and contribute to successful execution of Army missions."

As joint space doctrine evolves, Army space doctrine is also better defined. The Army's evolving space operations warfighting concept recognizes the importance of space capabilities to land force operations. It describes the future battlespace as a "seamless, vertical continuum" and recognizes that the land force commander must have timely and assured receipt of certain tactical information in the near-term as well as in support of the Objective Force. While the Global Information Grid infrastructure will eventually enable this capability, in the near to mid-term it may be necessary that ISR systems provide *direct access to* tactical commanders in theater and direct *control over limited effects* of space-based platforms. The concept also recognizes the interdependence of space systems and land force operations by articulating the operational requirement for each to support the other. Space-based systems are essential both for intelligence and communications connectivity as well as other vital functions from navigation to targeting. The Army will continue work with the joint community to achieve interoperability in this critical area. Conceptual analyses are also ongoing for joint space operations that may include force application from space in the context of effects coordination for land forces.

## Organization

Because space capabilities are inherently joint and are spread over several Army battlefield operating systems, space capabilities support all the enhanced operational concepts of *JV 2020*. As a result, the overall, synergistic benefit of space capabilities is not always readily apparent. This diversity also means that coordination of space capabilities to achieve optimal utilization can also be a real challenge. To assist in this process, the Army has created a Space Operations Officer Functional Area (FA 40) within the information operations career field. The Army Space and Missile Defense Command (SMDC), the specified proponent for space and the integrator of space activities for the Army, is the proponent for this functional area.

Full integration of space capabilities in land force operations is essential to achieving the Army's Transformation objective. To this end, the Army has embedded a Space Support Element (SSE) into the Interim Division design. SSEs are also being proposed in the corps redesign and for echelons above corps. Consisting of FA 40 Space Operations Officers and enlisted support personnel, the SSE will enable ground component commanders to fully exploit space system capabilities and products by bringing the specialized space operational expertise to bear in the planning and execution of land operations.

To provide space support capabilities that require high value, low-density equipment, Army Space Command forces, the Army service component for U.S. Space Command, are being

reorganized to provide deployable capabilities to the ARFOR, EAC or corps land component forces. These deployable capabilities include satellite communications, PNT accuracy information, missile warning and dissemination, access to digital terrain data, enhanced weather capabilities, access to ISR, space surveillance information, and commercial remote sensing space imagery. Future capabilities will include Space Control negation capabilities and access to hyper-spectral imagery.

Other FA 40s are being placed on tables of distribution and allowance throughout the Army, on the Army Staff, and on staffs of other high level agencies such as the Joint Staff, the National Reconnaissance Office (NRO), the National Imagery Management Agency (NIMA) and the National Space Architect's Office (NSSA), to articulate Army requirements, integrate Army space activities, and assure Army equities in the joint space arena.

## Training

The Army is assessing its institutional training programs to determine the need for incorporation of a space-related core curriculum. . This initiative proceeded, but is directly in line with, the Space Commission (Congressional Commission to Assess United States National Security Space Management and Organization) recommendations recently approved for implementation by the Secretary of Defense. Incorporating a balance of live, virtual, and constructive approaches, representative space operations training under consideration includes:

- Integration of space into Battle Command Training Program (BCTP).
- Space support to distance learning methods and programs.
- Space support to en route mission planning and rehearsal.
- Space support to in-theater split-based mission planning and rehearsal.
- Continued development of digitized terrain databases for global training and mission rehearsal.
- Use of space systems to facilitate training between the U.S. forces and its domestic and international partners.

## Leader Development

The Space Operations Officer (FA 40) Basic Qualification Course at Army Space Command in Colorado Springs provides an education base and functional background for those assigned to FA 40 positions. To promote non-FA 40 leader understanding of space support to ground force operations and enhance general space-related awareness, the following leader development products/initiatives are being considered:

- A methodical examination of how adaptive technologies integrated into space-based communications and sensor systems can support mental agility and accelerated decision-making in tactical, operational, and strategic operations.
- Experimentation with space-based communications in support of split-based visualization and command

information procedures; use of global broadcast for these purposes; development of visualization and information technology-enabled leadership tools such as three-dimensional and holograph video-teleconferencing, illustration, and decision-support and planning tools.

- Articulation of Army requirements as a means of influencing joint tasking processes to ensure space systems are optimized in support of land forces.
- Placement of Army space operations personnel on joint staffs and selected other DOD or other agency or allied staff positions.
- Integration of space into Army leader development programs to include: Pre-Command Courses, SAMS, CGSOC, CAS3, the Sergeants Major Course, the Battle Staff NCO Course, and the BCTP.

## Materiel

Space products and services enhance the effectiveness of individual Army systems by providing the advantages of the ultimate high ground while being *relatively* less vulnerable and politically encumbered than terrestrial or aerial systems. The systems that provide space capabilities to the warfighter have modernization programs to ensure the readiness of the Legacy and Interim Forces as well as to meet the demands of the Objective Force.

Army operational capabilities are often assessed along functional or battlefield operating system lines. Not a traditional operating system in its own right, space significantly enables many traditional military functions. Modernization of space systems that provide enhanced operational capabilities must be synchronized with modernization of other Army systems and forces, and with joint space capabilities. Increasingly, commercial space initiatives will also augment military space.

Without going into system details, more fully addressed elsewhere in this plan, this annex touches on a variety of space-related systems to give readers a broad view of how Army space modernization contributes to the future success of land component forces to "see first, understand first, act first, and finish decisively."

### Communications

Army forces are dependent on electronic communications with operational concepts increasingly dependent on assured beyond line of sight (BLOS) communications. The SATCOM architecture provides the connectivity that enables forces to leverage all other space capabilities. Robust, reliable, space-based communications provide key capabilities to land forces.

The various military satellite communications (MILSATCOM) programs support communication requirements at all echelons during force projection. Included are secure, reliable, high-capacity (wide bandwidth and multichannel) service and en route mission planning and rehearsal capabilities. MILSATCOM, augmented by commercial space communications, enables logistics management by staffs in CONUS or other home bases, providing

the capability to exchange and update large databases between split-based elements. Supplies in transit or in-theater can be tracked by satellite-based communications linked to the global positioning system (GPS). Such capabilities reduce the footprint in theater by eliminating the need to stockpile equipment and containers. They also make logistics more agile, permitting en route visibility of assets and dynamic transport of supplies into theater. Added benefits are reduction in the in-theater force and strategic lift requirements as well as reduced vulnerability. The Global Broadcast Service (GBS) has the potential to support soldier services and provide a means to maintain current situational awareness on theater-specific information. Such capabilities are especially valuable during extended deployments involving the full spectrum of military operations from humanitarian assistance through major conflict.

To enhance the benefits of space-based communications in the Legacy and Interim Forces, the Army is fielding smaller, more versatile, more mobile, secure SATCOM terminals. The Legacy and Interim Forces will have improved capability to extend terrestrial networks, achieve BLOS requirements, enable reach back, reduce lift requirements, and improve data distribution to meet increasing voice, data and imagery transmission demands. Milstar satellites and terminals will provide Legacy to Objective Forces protected/anti-jam satellite communications currently not available to our tactical forces at corps and division level. Tactical SATCOM for the Objective Force will focus on increased capacity, integration, scalability, modularity, and mobility. SATCOM connectivity will be a key enabler of battle command on-the-move to ensure Objective Force tactical commanders receive the right information at the right time without being tied to a traditional tactical command post. Army management of the communications payloads on new, more capable communications satellites will allow improved throughput between deployed forces and their sustaining base by several orders of magnitude to meet the requirements generated by new weapon platforms and operational concepts. Lastly, continued Army participation in the DoD wideband ground segment will ensure delivery of Defense Information Systems Network (DISN) services to the deployed warfighter.

**Positioning, Navigation and Timing**

All weather, accurate PNT provided by GPS satellites is critical to battlespace awareness, enhanced lethality, and survivability. GPS receivers enable elements to know precisely where they are, even when the surrounding terrain is unfamiliar, uncharted, or featureless. The user segment consists of receivers that accept the satellite signals and compute position and time for the user—a capability that enhances accurate blue force tracking (reducing and preventing fratricide), precision targeting, and synchronization on the battlefield. The GPS user equipment family consists of different models that meet a range of needs from the foot Soldier to high performance weapons platforms.

Embedded GPS receivers on weapons platforms and guided munitions support extended-range engagements required to shape the battlespace in depth.

BLOS blue force tracking systems integrate GPS and communications technology, enabling extended range reporting of friendly location and status. These systems also can provide a link between digitized and nondigitized forces such as Legacy Force and coalition members. On-going efforts to embed, integrate, and miniaturize GPS into our equipment and weapons platforms highlight the criticality of this capability across the spectrum of operations, and our increasing reliance on GPS satellites. Modernization efforts are focusing on embedded capabilities and protection of use of the PNT GPS system. In that future adversaries are likely to exploit urban and complex terrain for sanctuary, it is essential that ground forces be able to depend on consistent PNT GPS support in that environment. The Navigation Warfare (NAVWAR) program, directed by the Under Secretary of Defense (A&T) to address known GPS vulnerabilities, is now a component of the GPS modernization program. NAVWAR examined design alternatives to provide enhanced military performance and reduce vulnerability while maintaining uninterrupted civilian use. Greater host vehicle dynamics and the need for interfaces to other navigation, communication, or control systems will require enhanced capabilities for Objective Forces. The Army anticipates upgrading or replacing all Army GPS receivers during the FY03-11 timeframe.

**Weather, Terrain, and Environmental Monitoring**

Detailed, current knowledge of local terrestrial weather and its effects on operations enhances operational planning. Tactical commanders need terrestrial weather information without the 4 to 6 hour latency imposed by the current 2 ball polar-orbiting Civil METSAT constellation. Plans to fly the National Polar-orbiting Operational Satellite System (NPOESS) will bring that constellation to 3, reducing the time delay between passes. The emerging capability to integrate near-real-time "tactical weather" from geo-stationary and polar-orbiting weather satellites will greatly enhance the planning capability of Legacy to Objective land forces by providing detailed, current knowledge of local weather conditions and high resolution information for input to centrally-prepared forecasting models. Modernization will provide current weather information and enhance dissemination so that it can be integrated more effectively into the battlespace planning process.

Through the use of ground segments such as small tactical terminals and integrated meteorological terminals (IMETS), space systems will provide information on conditions in remote contingency areas where surface observations do not exist. IMETS receives weather information from a range of weather input sources. These include relays or direct receipt from AF weather satellite equipment from polar-orbiting civilian and defense meteorological satellites, broadcasts from civilian forecast centers, the Air Force Weather Agency, and tactical relay from artillery meteorological sections and remote sensors. IMETS processes and collates forecasts, observations, and climatological data to produce timely and accurate weather products tailored to the specific warfighter's needs. Automated tactical decision aids provide significant

weather and environmental support to warfighters. Graphics displayed as part of a Common Tactical Picture will enable warfighters to see tailored weather effects on specific operations, weapon systems, personnel, and equipment.

Army forces also require on-demand, accurate terrain data and maps of specific theaters and areas of operations around the world. Digital terrain data is used in simulators to accomplish mission planning and rehearsals and to provide updated map products to land forces**.** Space assets provide the capability to meet that need. While currently limited to specific major theaters, evolving capabilities will provide global digital and 3D terrain products, enhancing battlefield visualization, operational planning, and targeting for Objective Force units.

Environmental monitoring capabilities of space assets will also provide key information to land force commanders. Our ability to conduct intelligence preparation of the battlespace for the Objective Force can be enhanced by hyper-spectral imagery (HSI) from space. HSI allows us to detect environmental changes that heretofore could only be detected by Soldiers on the ground (usually too late to have been considered in any operational planning). Additional capabilities include soil saturation monitoring for trafficability analysis, man-made or natural obstacle detection and avoidance, and observation and prediction of the effects of weapons of mass destruction. Current warfighter experiments, which leverage civil and commercial space assets, are examining the use of HSI to support the warfighter. As the technology develops, this capability will be integrated into the planning process to support the Objective Force.

There are a number of phenomena that occur on the surface of the Sun and in space that, can have a dramatic effect on communications, GPS signal reception, and radar systems. Knowledge of these "space weather" events and assessment of when, how, and to what degree friendly systems will be affected allows commanders to plan around periods of signal interruptions.

**Intelligence, Surveillance, and Reconnaissance (ISR)**

Space assets allow us to “see and hear” the enemy from the ultimate high ground without putting Soldiers at risk. On-demand, tailored ISR data is key to the tactical level commander's decisive action, information dominance, and high operational tempo (OPTEMPO) including a battle rhythm with short decision cycles. Getting timely information with assured receipt to the warfighter is a key focus of Army Space Modernization. The near-term strategy to modernize ISR assets is to reduce the number of systems involved in receiving and disseminating ISR data for the land component commander. Satisfaction of the need for timely and assured receipt of key ISR data may require theater downlink and dynamic tasking and retasking capability for ISR assets. Mobile, dynamic networks and the seamless integration of terrestrial, airborne and space communications will allow information to be distributed among sensors, warriors, weapons platforms, and support bases so that land force commanders can exploit “speed” and “knowledge” to increase Objective Force OPTEMPO information.

The situational awareness enabled by Army tactical exploitation of national capabilities (TENCAP) provides Legacy and Interim Forces early and continuous battlespace visualization. The Tactical Exploitation System, a TENCAP initiative, provides a highly deployable, integrated, scaleable intelligence system specifically designed for split-based operations. Emerging versions will have robust global and tactical communications connectivity. It serves as a preprocessor of the All Source Analysis System, the JSTARS common ground station, and the Digital Topographic Support System.

Future space sensors will detect ground targets, and link through Distributed Common Ground System - Army (DCGS-A) to assure timely target information to the tactical warfighter. Access to a growing array of commercial imagery products will also be available through efficient downlinks embedded in the DCGS-A.

Objective Force command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) systems, embedded at all echelons, must fit seamlessly within the joint structure, including space assets, and be effective even in a degraded environment. The Army will continue work with the joint community to achieve interoperability in this critical area.

**Missile Warning**

The joint tactical ground station (JTAGS) directly receives tactical ballistic missile launch data collected by Defense Support Program surveillance satellites. JTAGS enables early warning to deployed forces by providing the theater commander an in-theater processing capability that computes the estimated launch point and predicted impact area. This supports implementation of timely passive defense measures, as well as the execution of joint theater missile defense (JTMD) attack operations that may include unmanned aerial vehicles (UAV), special operations forces, Apache helicopters, and Army tactical missile systems. Expanded battlespace and efficient fire distribution for Patriot and other active defense systems, including their ability to "slew-to-cue" can also be supported by JTAGS. In the near-term, space-based infrared system (SBIRS) surveillance satellite data processed through the improved JTAGS, with multi-mission mobile processor ($M^3P$) configuration, will provide increased accuracy and timeliness of: launch point estimation, impact point prediction, and cueing and alerting data provided to warfighters and weapon systems.

**Space Control**

Future military operations can assume neither uninterrupted nor sole access to space products. As more nations gain access to space capabilities, the need to ensure U.S. access to space will become a military necessity. There is already wide availability of global, satellite-based communications systems that have military utility, and the availability of high-resolution commercial imaging is a source of great concern. As order-to-delivery times decrease, commercial imaging systems will be capable of providing tactically significant products to potential adversaries. Common access to space capabilities will challenge, perhaps even limit U.S. ability to achieve

strategic surprise. These capabilities could assist an adversary's implementation of an anti-access strategy and potentially limit U.S. military options. Space control will be an essential element in ensuring theater access, access to space and space capabilities, and land force information superiority. Part of the Army's space modernization program is to develop the suite of technologies and DTLOMS solutions to assure access to required space capabilities for the Objective Force while denying the same to any adversary. Future Army operations and equipment will require information operations methods that protect our space capabilities, exploit an adversary's space capabilities, and protect friendly forces from space-based observation. These methods will include capabilities for in-theater space surveillance; protecting vital command control communications/intelligence surveillance and reconnaissance (C3ISR) assets; and deceiving, denying, degrading, disrupting and/or destroying an adversary's space systems when directed.

## Soldier

OPMD XXI established the Space Operations Officer (Functional Area 40) as part of the information operations career field. This developing cadre of space professionals plays an increasingly important role in the Army Transformation. In addition to identifying and designating or converting additional positions for FA 40s throughout the Army and joint agencies, additional FA 40 designee positions have been identified to better prepare officers for the highly skilled FA 40 positions. Additional advanced civil schooling and training with industry requirements are also being identified. A project development skill identifier has also been established to enable a study of military occupation specialty (MOS) skills necessary for Soldiers working in a space environment. This study will assess the need for an additional space related-MOS.

## Summary

As critical components of both peace-keeping and wartime combat, combat support, and combat service support processes, space-based systems will host substantial force enhancement capacity that will deliver vastly improved connectivity, situational awareness, decision support system assistance, and BLOS precision engagement capabilities to Transformation Forces. Those enhancements will enable and underwrite the success of future Objective Force units operating in a distributed, network-centric, non-linear environment. To assure access to these space capabilities and deny those benefits to adversaries, Army ground forces will provide in-theater space control capabilities developed in concert with other service efforts.

Army space modernization is on the right azimuth but is still in its infancy. Continued efforts to understand Army equities in space, translate those equities into validated requirements, and integrate those requirements into Army and joint programs and architectures are integral to the successful execution of the Army Transformation Campaign Plan.

Adherence to Army and joint requirements generation system procedures ensures that doctrine,

training, leader development, organization, and Soldier solutions are considered before materiel solutions.

## Priorities

Army Space Modernization efforts to enhance warfighter support from space focus on establishing information superiority and enabling the enhanced operational concepts of *JV 2020*. Army space modernization priorities are:

- Support satellite communications growth and connectivity to meet DoD delegated MILSATCOM responsibilities and the C4 requirements of Army Transformation.
- Improve the timeliness and assured receipt of ISR capabilities to the warfighter to meet the tactical ISR requirements of Army Transformation.
- Assure ground force receipt of continuous PNT data in all operational environments and resolve GPS vulnerability to jamming in the near-term.
- Develop space control capabilities to assure access to key space capabilities and deny access to our adversaries.
- Provide timely and assured missile warning (SBIRS and M3P) to Army Transformation forces.
- Provide timely weather, terrain, and environmental monitoring data in support of tactical ground force operations.
- Provide assured BLOS BFT capabilities to forces outside the range of organic ground force C3 networks.

# Annex H: Homeland Security

## General

Defense of the United States has evolved into a new, more complex series of threats significantly different from those previously seen during the past 226 years. The present threat of terrorism toward Americans, committed on American soil, has required a different perspective on what "provide for the common defense and general welfare of the United States"[1] means. This mission is founded in the U.S. Constitution, established in Title 10 USC, and directed in the 1999 Unified Command Plan. The Army is deployed, trained, and equipped to accomplish the full range of Homeland Security (HLS) tasks. This became dramatically apparent in the aftermath of the terrorist attacks against the World Trade Center and the Pentagon on 11 September 2001. The Army is deployed throughout the Nation with widely dispersed stationing of Active, National Guard and Army Reserve units and facilities.

## Overview

A broad, "all-hazards" definition is necessary to properly describe the full-spectrum of requirements for the Homeland Security mission. Within this construct, Homeland Security is made up of two major components: *Homeland Defense, and Civil Support*. The range of requirements includes providing air and missile defense and responding to weapons of mass destruction (WMD) attack, to mitigating the effects resulting from a hurricane, forest fire, or other disaster.

The definition for Homeland Security is: The preparation for, prevention of, deterrence of, preemption of, defense against, and response to threats and aggressions directed towards U.S. territory, sovereignty, domestic population, and infrastructure; as well as crisis management, consequence management, and other domestic civil support.

**Homeland Defense (HLD).** Homeland Defense (pending review and approval) is defined as: The protection of U.S. territory, sovereignty, domestic population, and critical infrastructure against external threats and aggression. Under homeland defense, the Army has requirements associated with four mission areas: Defense of Sovereign Territory, Air and Missile Defense, Information Assurance, and WMD Defense and Response.

**Civil Support (CS).** Civil Support is defined as Department of Defense support to U.S. civil authorities for domestic emergencies, and for designated law enforcement and other activities. It includes three mission areas for the Army: Disaster Response, Civil Disturbance Response, and Support to Special Events. The Army has historically deployed annually a large number of units to assist local, State, and Federal authorities in responding to natural and manmade disasters. Through the Total Army Analysis (TAA) process the Army

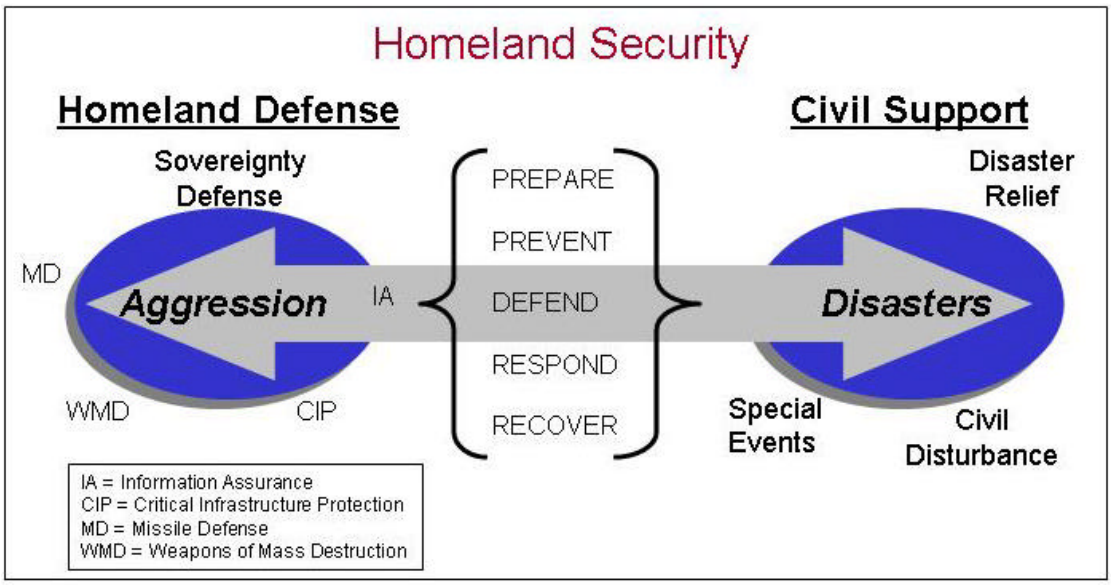
[1] Article I, Section 8, U.S. Constitution.

has identified requirements associated with the Disaster Response mission area. The Army requirements associated with civil disturbances and special events tend to be infrequent and do not produce additional requirements for the Army.

The Army is uniquely capable of supporting civil authorities in a full range of domestic contingencies. Rapid, responsive, Army support to civil authorities and agencies is often a critical and decisive element in disaster or crisis mitigation. The Army possesses many resources that have great utility in HLS operations. Many of the capabilities that are required to support civil authorities are the same capabilities required to support military forces and installations in the effort to prosecute the global war on terrorism. As the Army transforms, Homeland Security needs to be maintained as a primary consideration when developing force structure to ensure the Army is capable of fighting and winning our Nation's wars and also capable of defending the homeland.

The Army National Guard fulfills a key role in Homeland Security. Army National Guard units, operating under Title 32 authority, are responsive to their State Governor and are a key part of the local and State response capabilities. One uniquely organized and trained unit within the National Guard in meeting Homeland Security requirements is the WMD Civil Support Team (CST). The WMD-CSTs are designed to support local, State, and Federal agencies response to an attack or incident involving WMD. The CSTs leverage the best military technology and expertise available and ensure the local incident commander had military personnel who could rapidly and accurately translate his requirements into requested response capabilities. There are currently authorizations for 32 WMD-CSTs.

The CST mission is presently defined as: "support civil authorities at a domestic chemical, biological, radiological, nuclear, or high yield explosive (CBRNE) incident site by identifying CBR agents/substances, assessing current and projected consequences, advising on response measures, and assisting with appropriate requests for additional state support." These teams will be called upon as a part



of a State emergency response or will mobilize in a federal support role.

## Investment Strategy

According to the Quadrennial Defense Review 2001 Report, "defending the Nation from attack is the foundation of strategy." Furthermore, the defense strategy "restores the emphasis once placed on defending the United States . . . to safeguard the Nation's way of life, its political institutions, and the source of its capacity to project decisive military power overseas." The Defense force-sizing construct "explicitly calls for the force to be sized for defending the homeland, forward deterrence, warfighting missions, and the conduct of smaller-scale contingency operations." Given these requirements, our long-range investment strategy must be in concert with identifying additional requirements and meeting the needs of transforming the Army. The Army must continue to modernize and recapitalize legacy systems, and adapt and accelerate acquisition, fielding, testing and development of systems with enhanced capabilities that meet the Homeland Security requirements.

Through the TAA process the Army has identified requirements for each of the Homeland Security mission areas. The specific sourcing and force structure decisions for Homeland Security will be made during the TAA 2009 Resourcing Phase. It is expected that new requirements will be identified and these new requirements will cause re-prioritization and re-allocation of resources to meet mission requirements. The current FY03-07 Army Plan features a $3.9 billion funding adjustment to meet Homeland Security requirements. A portion of these funds will provide equipment for increased physical security and installation access control. Additionally, resources are required to fund for critical Interagency coordination (including all Services, Government agencies, non-government and private organizations), C4ISR, chemical weapons security, information assurance, and installation military construction to meet anti-terrorism and force protection requirements.

The Army's modernization priority of effort is to improve the Army's capabilities to conduct and support Homeland Security operations in the United States and, secondly, to support a second front to defeat terrorism worldwide.

## Summary

As it has for over 226 years, the Army will continue to take the lead in defending America. The Army's role in Homeland Security will evolve as policy, guidance, and doctrine develops. Army requirements identified through TAA09 provide an initial foundation, but additional guidance from the Office of Homeland Security and the Department of Defense are likely to refine the Army's roles and responsibilities. As new missions emerge, modernization and Transformation efforts will need to adapt to the changing requirements and environment to ensure our Army can meet the warfighters' needs.

# 2002 Army Modernization Plan

# Glossary

| | |
|---|---|
| A&T | Acquisition and Technology |
| A2C2 | Army Airspace Command and Control |
| A2C2S | Army Airborne Command and Control System (A2C2S) |
| A2SF | Army strength analysis and forecasting system |
| AAE | Army acquisition executive |
| AAMDC | Army Air and Missile Defense Commands |
| ABCS | Army Battle Command System |
| ABCS LAN | Army Battle Command System Local Area Net |
| AC | Active Component |
| ACADA | Automatic Chemical Agent Detector/Alarm |
| ACCE | Abrams Crusader Common Engine Program |
| ACE | Analysis Control Element |
| ACES | Army Continuing Education System |
| ACIP | Aircraft Component Improvement Program |
| ACIS. | Aircrew Integrated Systems |
| ACR | Armored Cavalry Regiment |
| ACS | Aerial Common Sensor |
| ACTD | Advanced Concept Technology Demonstration |
| ACT-E | Analysis and Control Team-Enclave |
| ACUS | Army Common User System |
| ADA | Air Defense Artillery |
| ADL | Distributed Learning |
| ADRS | Army National Guard Division Redesign Study |
| ADS XXI | Army Development System XXI |
| ADSI | Air Defense System Integrator |
| AFATDS | Advanced Field Artillery Tactical Data System |
| AFS | Army Facility Strategy |
| AGSE | Aviation Ground Support Equipment |
| AIM | M1A1 Abrams Integrated Management Program |
| AKM | Army Knowledge Management |
| AKO | Army Knowledge Online |
| AMD | Air and Missile Defense |
| AMDPCS | Air and Missile Defense Planning Control Station |
| AMDPCS | Air and Missile Defense Planning and Control System |
| AMDWS | Air and Missile Defense Workstation |
| ANAV | Autonomous Navigation System |
| AOA | Assessment of Alternatives |
| AP | Anti-Personnel |
| APAM | Anti-Personnel/Anti-Materiel |
| APKWS | Advanced Precision Kill Weapon System |

| | |
|---|---|
| APU | Auxiliary Power Unit |
| ARFOR | Army Forces |
| ARL | Airborne Reconnaissance Low |
| ARNG | Army National Guard |
| ARSOF | Army Special Operations Forces |
| ASAS | All Source Analysis System |
| ASAS-Light | All Source Analysis System-Light |
| ASE | Aircraft Survivability Equipment |
| ASIP | Advanced System Improvement Program |
| ASK | Assignment Satisfaction Key |
| ASTAMIDS | Aerial Standoff Minefield Detection System |
| AT | Anti-Tank |
| ATACMS | Army Tactical Missile System |
| ATCCS | Army Tactical Command and Control System |
| ATRRS | Army Training Requirements and Resources System |
| ATS/ATC | Air Traffic Services/Air Traffic Control |
| AUAO | Army University Access Online |
| AVLB | Armored Vehicle Launched Bridge |
| BASIC | Body Armor Set, Individual, Countermine |
| BAT | Brilliant Anti-Tank |
| BCT | Brigade Combat Teams |
| BCT's | Brigade Combat Teams |
| BDO | Battle Dress Overgarment |
| BFA | Battlefield Functional Areas |
| BFT | Blue Force Tracking |
| BFV | Bradley Fighting Vehicle |
| BIDS | Biological Integrated Detection System |
| BLOS | Beyond line-of-sight |
| $BMC^4I$ | Battle Management Command, Control, Communications, Computers, and Intelligence |
| BSN | Brigade Subscriber Node |
| BUP | Barracks Upgrade Program |
| BW | Biological Warfare |
| C&C | Guidance and Control |
| C2 | Command and Control |
| C3 | Command, Control, and Communications |
| C3I | Command, Control, Communications, and Intelligence |
| C4 | Command, Control, Communications, and Computers |
| C4ISR | Command, Control, Communications, Computers, Intelligence, Surveillance, Reconnaissance |
| CAD | Component advanced development phase |
| CAM/ICAM | Chemical Agent Monitor/ Improved Chemical Agent Monitor |
| CBMS | Chemical Biological Mass Spectrometer |
| CBRN | Chemical, biological, radiological, nuclear |
| CBRNE | Chemical, Biological, Radiological, Nuclear, or High Yield Explosive |

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|---|---|
| CBT | Computer-Based Training |
| CE | Chemical energy |
| CEP | Concept Evaluation Phase or Concept Evaluation Program |
| CGS | Common Ground Station |
| CHIMS | Information Management System |
| CHIMS | Counter-Intelligence/Human Intelligence Information Management System |
| CHS | common hardware and software |
| CHS | Combat Health Support |
| CI/HUMINT | Counter-Intelligence/Human Intelligence |
| CINC | Commander-in-Chief |
| CITV | Commander's Independent Thermal Viewer |
| CK | Containerized Kitchen |
| CLU | Command Launch Unit |
| CNR | Combat Net Radio |
| COE | contemporary operational environment |
| COMINT | Communications Intelligence |
| COMSEC | communications Security |
| CONUS | Continental United States |
| COP | Common Operational Picture |
| COTS | Commercial off-the-shelf |
| COTS | Civilian-off-the-shelf |
| CPDEPMEDS | Chemically Protected Deployable Medical System |
| CS | Combat Support |
| CSA | Chief of Staff, Army |
| CSS | Combat Service Support |
| CSSCS | Combat Service Support Control System |
| CTC | Cargo Transfer Company |
| CTC | Combat Training Center |
| CTP | Common Tactical Picture |
| DAC | Department of the Army Civilian |
| DARPA | Defense Advanced Research Projects Agency |
| DCGS-A | Distributed Common Ground System - Army |
| DCSDOC | Deputy Chief of Staff for Doctrine |
| DCSOPS | Army Deputy Chief of Staff for Operations |
| DCSPER | Army Deputy Chief of Staff for Personnel |
| DE/KE | Directed Energy/Kinetic Energy |
| DIMHRS | Defense Integrated Military Human Resources System |
| DISA | Defense Information Systems Agency |
| DoD | Department of Defense |
| DRID | Defense Reform Initiatives Directive |
| DSCS | Defense Satellite Communications System |
| DSP | Defense Support Program |
| DTF | Digital Training Facilities |
| DTLOMS | Doctrine, Training, Leader Development, Organization, Materiel, |

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|---|---|
| | and Soldier Systems |
| DTLOS | Doctrine, Training, Leader development, Organization, and Soldier |
| DTSP | Division TUAV SIGINT Payload |
| DTSS | Digital Topographic Support System |
| DTTP | Distributed Technology Training Project |
| EA | Electronic Attack |
| EAAD | Enhanced Area Air Defense |
| EAC | echelon above corps |
| EAD | echelon above division |
| eArmyU | Army University Access Online |
| EDT | Engineering Development Test |
| EFI | Efficient Facilities Initiatives |
| EMD | Engineering and Manufacturing Development |
| EO | Electro-Optic |
| EPLRS | Enhanced Position Location Reporting System |
| EREC | Enlisted Records and Evaluation Center |
| ERFS II | Extended Range Fuel System II |
| ETRAC | Enhanced Target, Range, and Classification |
| EW | Electronic Warfare |
| FA 40 | Functional Area – 40 |
| FAA | Federal Aviation Administration |
| FAAD | Sentinel and Forward Area Air Defense |
| FAIR | Federal Activities Initiative Reform |
| FBCB2 | Force XXI Battlefield Command Brigade and Below |
| FCR | Fire Control Radar |
| FCS | Future Combat Systems |
| FLIR | Forward Looking Infrared Radar |
| FMs | Field manuals |
| FMTV | Family of Medium Tactical Vehicles |
| FRP | Full-Rate Production |
| FUE | First Unit Equipped |
| FYDP | Future Years Defense Plan |
| GATM | Global Air Traffic Management |
| GBS | Global Broadcast Service |
| GCCS | Global Command and Control System |
| GCCS-A, | Global Command and Control System–Army |
| GCS | Ground Control Stations |
| GCSS | Global Command and Control System |
| GCSS-A | Global Combat Service Support–Army |
| GIG | Global Information Grid |
| GMLRS | Guided MLRS |
| GMLRS-Unitary | Guided MLRS Unitary |
| GOSC | General Officer Steering Committee |
| GPR | Ground Penetrating Radar |
| GPS | Global Positioning System |

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|---|---|
| GR/IFN | GUARDRAIL Information Node |
| GRCS | Guardrail Common Sensor |
| GSTAMIDS | Ground Standoff Minefield Detection System |
| HAB | Wolverine Heavy Assault Bridge |
| HEMTT | Heavy Expanded Mobility Tactical Truck |
| HEMTT-LHS | Heavy Expanded Mobility Tactical Truck-Load Handling System |
| HICON | Higher Control |
| HIMAD | High-Altitude to Medium-Altitude Air Defense |
| HIMARS | High Mobility Artillery Rocket Systems |
| HLD | Home Land Defense |
| HLS | Homeland Security |
| HMEE | High Mobility Engineer-Excavator |
| HMMWV | High Mobility Multipurpose Wheeled Vehicle |
| HMT | High Mobility Trailer |
| HQDA | Headquarters, Department of the Army |
| HSI | Hyperspectral imagery |
| HSTAMIDS | Handheld Standoff Mine Detection System |
| IAV | Interim Armored Vehicles |
| IAV-MC | Interim Armored Vehicle – Mortar Carrier |
| IAV-NBCRS | Interim Armored Vehicle-Nuclear Biological Chemical Reconnaissance System |
| IBA | Interceptor Body Armor |
| IBAS | Improved Bradley Acquisition System |
| IBCT | Initial Brigade Combat Team |
| ICHO | Improved Cargo Handling Operations |
| ICO | Raptor Intelligent Combat Outpost |
| ICV | Infantry Carrier Vehicle |
| IDIV | Interim Division |
| IED | Improvised Explosive Devices |
| IETM | Electronic technical manual |
| IEW | Intelligence and Electronic Warfare |
| IFF | Identification Friend or Foe |
| IMETS | Integrated Meteorological Terminals |
| IMINT | Imagery Intelligence |
| IOC | Initial Operational Capability |
| IOT&E | Initial Operational Test and Evaluation |
| IPB | intelligence preparation of the battlefield |
| IPB | Intelligence Preparation of the Battlespace |
| IR | Infrared |
| IS | Information Superiority |
| ISB | Intermediate Staging Base |
| ISO | International Standard Organization |
| ISR | intelligence, surveillance, and reconnaissance |
| IST | Installation Support Team |
| ISYSCON | Integrated System Control System |

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|---|---|
| ITAPDB | Integrated Total Army Personnel Data Base |
| JBPDS | Joint Biological Point Detection System |
| JCDB | Joint Common Database |
| JCDE | Joint Concept Development and Experimentation |
| JFC | Joint Force Commander |
| JFCOM | Joint Forces Command |
| JLENS | Joint Land Attack Cruise Missile Defense Elevated Netted System |
| JROC | Joint Requirements Oversight Council |
| JSFXD | Joint Fixed Site Decontamination |
| JSGPM | Joint Service General Purpose Mask |
| JSLIST | Joint Service Lightweight Suit Technology |
| JSSED | Joint Sensitive Equipment Decontamination |
| JSTARS | Joint Surveillance Target Attack Radar System |
| JTAGS | Joint Tactical Ground Station |
| JTAMD | Joint Theater Air and Missile Defense |
| JTF | Joint Task Force |
| JTMD | Joint Theater Missile Defense |
| JTRS | Joint Tactical Radio System |
| JV 2020 | *Joint Vision 2020* |
| JWCA | Joint Warfighting Capabilities Assessment |
| KE | Kinetic energy |
| LAN | Local area network |
| LDS | Lightweight Decontamination Systems |
| LDS | M17 Lightweight Decontamination System |
| LOSAT | Line-of-Sight Antitank weapon |
| LRIP | LOW-RATE INITIAL PRODUCTION |
| LUT | Limited User Test |
| LW | Light Weight |
| LW155 | Lightweight 155mm |
| M&S | Modeling and Simulation |
| MACOM | Major Command |
| MASINT | Measurement and Signature Intelligence |
| MC4 | Medical Communications for Combat Casualty Care |
| MCA | Military Construction Army |
| MCS | Maneuver Control System |
| MDS | Modular Decon System |
| MEADS | Medium Extended Air Defense System |
| MEDCOM | Medical Command |
| MEDEVAC | Medical Evacuation |
| MFCS | Mortar Fire Control System |
| MFCS | XM95 Mortar Fire Control System |
| MGS | Mobile Gun System |
| MHE | Materiel Handling Equipment |
| MICAD | Multipurpose Integrated Chemical Agent Detector |

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|---|---|
| MILSATCOM | Military Satellite Communications |
| MILSTAR | Military Strategic and Tactical Relay |
| MIST | Multiband Integrated Satellite Terminal |
| MLRS | Multiple Launch Rocket System |
| MNS | Mission Needs Statement |
| MOS | Military Operational Skill |
| MPCV | Mine Protected Clearance Vehicle |
| MRI | Medical Reengineering Initiative |
| MSD | Maintenance Support Device |
| MSE | Mobile Subscriber Equipment |
| MSTAR | MLRS Smart Tactical Rocket |
| MTI | Moving Target Indicator |
| MTW | Major Theater War |
| MWR | Morale, Welfare, and Recreation |
| NAF | Nonappropriated Fund |
| NAS | National Airspace System |
| NATO | North AtlanticTreaty Organization |
| NAVWAR | Navigation Warfare |
| NBC | Nuclear, Biological, and Chemical |
| NCO | Noncommissioned Officer |
| NIMA | National Imagery Management Agency |
| NMD | National Missile Defense |
| NMS | National Military Strategy |
| NOC-V | Network Operations Center vehicles |
| NRO | National Reconnaissance Office |
| NSSA | National Space Architect's Office |
| O&O | Operational and Organizational |
| O&O | Organization and Operations |
| OES | Officer Education System |
| OFW | Objective Force Warrior |
| OICW | Objective Individual Combat Weapon |
| OMB | Office of Management and Budget |
| OMPF | Official Military Personnel File |
| OMSA | Other mission support aircraft |
| OPCON | Operational control |
| OPMS XXI | Officer Personnel Management System |
| OPTEMPO | Operational tempo |
| ORD | Operational Requirements Document |
| OS | Overwatch Sensors |
| OSA | Operational support airlift |
| OSD | Office of the Secretary of Defense |
| OT | Operational Testing |
| PAC-3 | Patriot Advanced Capability Mod 3 |
| PBAS | Portable Biological Aerosol Sampler |
| PDRR | Program Definition and Risk Reduction |

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|---|---|
| PDSI | Project Development Skill Identifier |
| PEI | Precision Engagement Information |
| PERSCOM | Total Army Personnel Command |
| PGMM | XM395 Precision Guided Mortar Munition |
| PLS | Palletized Load System |
| PNT | Position, Navigation, and Timing |
| PNT | Position, Navigation and Timing |
| POM | Program Objective Memorandum |
| POS/NAV | Position/Navigation |
| PPV | Public Private Ventures |
| PSYOPS | Psychological Operations |
| PVT | Production Verification Testing |
| QDR | Quadrennial Defense Review |
| QOLE,D | Quality of Life Enhancement, Defense |
| QR | Quadrupole Resonance |
| R&D | Research and Development |
| RC | Reserve Component |
| RCI | Residential Communities Initiative |
| RDA | Research, Development and Acquisition |
| REAL | Reserve Education and Learning |
| REBS | Emplaced Bridge System |
| RF | Radar Frequency |
| RFI | Radar Frequency Interferometer |
| RFPI | Rapid Force Projection Initiative |
| RRT | Rapid Response Teams |
| RSTA | Reconnaissance Surveillance and Target Acquisition |
| RTCH | Rough Terrain Container Handler |
| RWS | Remote Workstation |
| S&T | Science and Technology |
| SACO's | Stability and Support Operations |
| SAL | Semi-active laser |
| SAR | Synthetic aperture radar |
| SAT | Systems Approach to Training |
| SATCOM | Satellite Communications |
| SBIRS | Space-Based Infrared System |
| SCA | Software communications architecture |
| SCAMP | Single Channel Anti-Jam Manportable |
| SCBA | Self-containing Breathing Apparatus |
| SECDEF | Secretary of Defense |
| SEMA | Special Electronics Mission Aircraft |
| SEP | M1A2 System Enhancement Program |
| SHF | Super High Frequency |
| SHORAD | Short-Range Air Defense |
| SICPS | Standardized Integrated Command Post System |
| SIDPERS-3 | Standard Installation Division Personnel System-3 |

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|---|---|
| SIGINT | Signals Intelligence |
| SIIRCM | Suite of Integrated Infrared Countermeasure |
| SINCGARS | Single Channel Ground and Airborne Radio System |
| SIRFC | Suite of Integrated RF Countermeasures |
| SLAMRAAM | Surface Launched Advanced Medium-Range Air-to-Air Missile |
| SMART | Simulation and Modeling for Acquisition Requirements and Training |
| SMART-T | Secure Mobile Anti-Jam Reliable Tactical Terminal |
| SMDC | Space and Missile Defense Command |
| SMSR | Strength Management System Redesign |
| SOSA | Army Human Resource Systems of Systems Database |
| SOUTHCOM | U.S. Southern Command |
| SPORT | Soldier On-System Repair Tool |
| SRBSDS | Short Range Biological Standoff Detection System |
| SSCs | Small Scale Contingencies |
| SSE | Space Support Element |
| STAMIDS | Standoff Minefield Detecting System |
| STAR-T | SHF Tri-Band Advanced Range Extension Terminal |
| TAA | Total Army Analysis |
| TAA09 | Total Army Analysis 2009 |
| TADLP | Army Distance Learning Program |
| TADSS | Training Aids, and Devices, Simulators, and Simulations |
| TAPDB | Total Army Personnel Database |
| TASS | The Army School System |
| TATS | The Army Training System |
| TBM | Theater Ballistic Missiles |
| TCP | Transformation Campaign Plan |
| TDA | Table of Distribution and Allowances |
| TENCAP | Tactical Exploitation of National Capabilities |
| TES | Tactical Exploitation System |
| THAAD | Theater High Altitude Area Defense |
| THSDN | Tactical High Speed Data Network |
| TI | Tactical Internet |
| TIM | Toxic Industrial Materials |
| TLGOSC | Training and Leader Development General Officer Steering Committee |
| TMDE | Test, Measurement, and Diagnostics Equipment |
| TMIP | Theater Medical Information Program |
| TOC | Tactical Operations Center |
| TOE | Table of Organization and Equipment |
| TOW 2A | Tube-launched, optically-tracked, wire-guided missile |
| TOW 2B | Tube-launched, optically-tracked, wire-guided missile |
| TPED | Tasking, Processing, Exploitation, and Dissemination |
| TRADOC | Training and Doctrine Command |
| TRI-TAC | Tri-Service Tactical Communications |
| TSV | Theater Support Vessel |

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|---|---|
| TTHS | Trainees, Transients, Holdees, and Students |
| TTP | Tactic, technique, and procedure |
| TUAV | Tactical Unmanned Aerial Vehicle |
| TWI | Training With Industry |
| UAV | Unmanned Aerial Vehicle |
| UE | User Equipment |
| UGVROP | Unmanned Ground Vehicle Rapid Obscuration Platform |
| USACFSC | U.S. Army Community and Family Support Center |
| USAF | U.S. Air Force |
| USAR | U.S. Army Reserve |
| USF | Unit Set Fielding |
| USP. | Utility Systems Privatization |
| UXO | Unexploded Ordnance |
| VTT | Video teletraining |
| WIN-T | Warfighter Information Network-Tactical |
| WKN | Warrior Knowledge Network |
| WMD | Weapons of Mass Destruction |
| WTEM | Weather, Terrain, and Environmental Monitoring |